SPECIAL COLLECTOR'S EDITION

SCIENTIFIC AMERICAN

SCIENCE FOR SOCIAL JUSTICE

Research shows the sources and costs of bias and how to make a more equitable world

INSIDE

Underpinnings of injustice

Health threats of inequity

Power imbalances that harm the environment

Protecting voting rights

Better economic opportunities for women

Empowering community resilience

SPRING/SUMMER 2022

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FROM THE EDITOR

Science for Good

At least 16 U.S. states have passed bills banning critical race theory from school curriculums, in some cases prohibiting the teaching of terms such as "racial prejudice," "patriarchy" and "structural inequality." These restrictions use critical race theory as a scare tactic, even though the actual research examines only how race and law interact, not *all* concepts of race and society. At the least, these bills misrepresent actual findings. At worst, they are a disinformation campaign (*page 12*).

These kinds of political tactics undermine some of the basic goals of education, such as critical reasoning and the study of history and science. Important political and policy decisions about education, health care, the planet and democracy hang in the balance, and they should all be informed by evidence. Robust research is underway on every problem that plagues us, from racism and white supremacy to lack of health care and environmental injustice. Scholarship has revealed powerful tools for undoing foundational inequalities in our society, and we should use those tools.

Thousands marched in London in 2016, protesting police brutality against Black people in America.

Implicit bias feeds harmful stereotypes and has many real-world effects, such as preventing Black people from receiving quality health care, education or housing (*page 10*). Prejudices are built into everyday data algorithms used by policy makers and health providers to determine care and even legal proceedings (*page 16*). Some may believe they are free of prejudice but enact "microaggressions" on marginalized members of society, causing psychological harm and furthering discrimination (*pages 6* and *22*).

Inequality undermines the health of a large proportion of the population. The chronic stress of poverty creates cycles of sickness (*page 26*), inciting lifelong health struggles disproportionately borne by people of color and low-income groups (*page 32*). A novel coronavirus took an unequal toll on those groups. And new treatments and medicines are primarily tailored toward white (usually male) patients as the result of biased testing protocols (*pages 44, 50* and *51*).

Those without power or money are more likely to feel the consequences of a polluted and depleted planet (*page 54*). The latest studies conclusively show that Black, Asian and Hispanic people in the U.S. breathe in significantly more deadly particulate matter from emissions than white people (*page 60*). Because their citizens do not have access to COVID vaccines, some nations' representatives have even been unable to participate in important international meetings on the environment and climate (*page 62*).

Empowering each member of society pays dividends. Diversity in workplaces encourages the search for fresh perspectives and leads to better decision-making and problem-solving (*page 74*). Resilience and innovation can be found in long-dismissed marginalized communities as well (*page 92*). Protests and campaigns by Black Lives Matter in the past two years have altered our discourse around these topics, continuing the work of the Civil Rights Movement (*page 112*). But we're at risk of letting a global pandemic and growing populism stymie advances toward equality if we turn our backs on hard-won progress (*pages 98* and *126*).

As sociologist Aldon Morris wrote in *Scientific American* in 2020, activists on the streets have won valuable symbolic changes—renaming buildings, streets and monuments and rallying public awareness. The work must now undo the oppressive forces built into the very makeup of our society. Never before has science had a more vital mission. SA

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Senior Editor, Collections, editors@sciam.com

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UNDERPINNINGS OF INJUSTICE

6 Who Discriminates?
Is discriminatory behavior widely dispersed or highly concentrated in a small number of people?
By David Z. Hambrick

10 How to Think about Implicit Bias
The phenomenon is real—and it matters.
By Keith Payne, Laura Niemi and John M. Doris

12 Disinformation Campaign
The election of anti-CRT candidates demonstrates how exploiting white fear continues to galvanize voters.
By Daniel Kreiss, Alice Marwick and Francesca Bolla Tripodi

16 The Harm That Data Do
Learning from protests against algorithmic systems worldwide is key to a just and equitable future.
By Joanna Redden

20 A Chilling Effect
I am a future psychiatrist hoping to provide care to transgender people. But I fear new anti-trans laws will make it difficult to do so. *By Ashley Andreou*

22 Death by a Thousand Cuts
The everyday slights, insults and offensive behaviors that people of marginalized groups experience in daily interactions cause real psychological harm.
By Derald Wing Sue

HEALTH IMPACTS OF INEQUALITY

26 The Health-Wealth Gap
The growing gulf between rich and poor inflicts biological damage on bodies and brains. *By Robert M. Sapolsky*

32 Born Unequal
Improving newborn health and why it matters now more than ever. *By Janet Currie*

40 How to Reduce Maternal Mortality
To prevent women from dying in childbirth, the first step is to stop blaming them.
By Monica R. McLemore and Valentina D'Efilippo

44 Not Just for Men
Researchers and doctors must dig deeper into gender differences before they can provide women with better treatments. *By Marcia L. Stefanick*

50 Clinical Trials Need More Diversity
It's unethical and risky to ignore racial and ethnic minorities. *By the Editors*

51 Racism in Medical Tests
Many diagnostic assessments are inherently biased against people of color. *By the Editors*

ENVIRONMENTAL JUSTICE

54 The Environmental Cost of Inequality
Power imbalances facilitate environmental degradation—and the poor suffer the consequences. *By James K. Boyce*

60 Toxic Inequality
A trend of disproportionate exposure to deadly air pollution among Asian, Hispanic and Black people persists in most cases regardless of the emission source, a study finds. *By Robin Lloyd*

62 Unheard Voices
Vaccine inequality is shutting out the most vulnerable people from plans to save the planet. *By Nnimmo Bassey*

64 More Food, Less Waste
Cutting losses across the food chain could vastly increase supply and significantly reduce carbon emissions. *By Chad Frischmann and Mamta Mehra*

DIVERSE WORK SPACE

74 How Diversity Works
Being around people who are different from us makes us more creative, more diligent and harder-working.
By Katherine W. Phillips

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78 Women's Work
As more women contribute to the economy, life gets better for everyone. Why are the barriers to opportunity so hard to change?
By Ana L. Revenga and Ana Maria Munoz Boudet

84 The Brilliance Trap
How a misplaced emphasis on genius subtly discourages women and Black people from entering certain academic fields. *By Andrei Cimpian and Sarah-Jane Leslie*

MAKING A MORE EQUITABLE WORLD

92 Social Resilience
Underserved Black communities are often depicted as dysfunctional. Their resiliency has long been overlooked. *By Nancy Averett*

98 Deepening Fault Lines
The pandemic energized the Black Lives Matter movement—and provoked a dangerous backlash.
By Aldon Morris

102 A Tapestry of Alternatives
Making peace with the biosphere will require building communities and relationships that are focused on sustaining life—human and nonhuman. *By Ashish Kothari*

112 The Power of Social Justice Movements
Black Lives Matter takes the baton from the Civil Rights Movement. *By Aldon Morris*

126 Intensified Inequity
The poor, no matter where they live, will suffer the greatest lasting toll from the pandemic.
By Joseph E. Stiglitz

DEPARTMENTS

1 From the Editor
Science for Good

128 End Note
Protect Voting Rights
Evidence shows they boost suffrage, not fraud.
By the Editors

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1

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12 Disinformation Campaign

16 The Harm That Data Do

20 A Chilling Effect

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Illustration by Rudy Gutierrez

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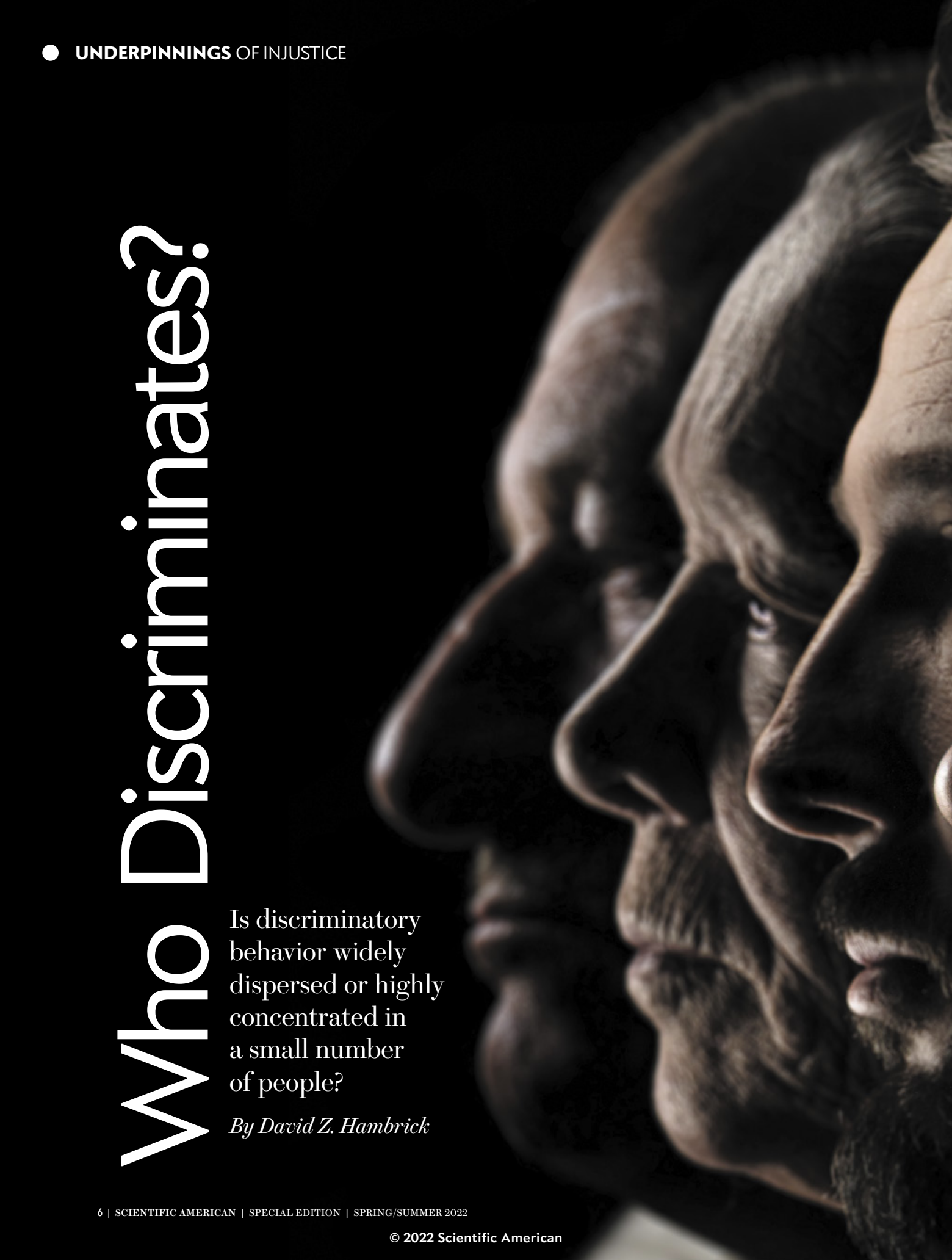
Who Discriminates?



Is discriminatory behavior widely dispersed or highly concentrated in a small number of people?

By David Z. Hambrick

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AMERICANS ARE BECOMING MORE TOLERANT OF PEOPLE of different races, ethnicities and sexual orientations, recent research indicates. Yet discrimination toward people in marginalized groups persists at disturbingly high levels. Scientists have proposed two hypotheses to explain this apparent paradox. The dispersed discrimination account holds that, because of implicit biases, most people—even those who hold strong egalitarian beliefs—regularly engage in subtle but still harmful acts of discrimination, albeit with little or no awareness. The concentrated discrimination account counters that a numerical minority of "bad actors"—highly and explicitly biased people—are responsible for most discriminatory acts.

These competing hypotheses lead to different recommendations about how to effectively combat discrimination in businesses, universities, the military, and other organizations. If the dispersed discrimination account is correct, then arguably everyone in a given organization should undergo training to reduce implicit bias. If the concentrated discrimination account is true, then this type of training is unlikely to reduce discrimination in the organization, and policies should target explicit bias in a relatively small number of bad actors. A study in 2021 by social psychologists Mitchell Campbell and Markus Brauer, both then at the University of Wisconsin–Madison, tested these hypotheses through a series of survey studies and field experiments involving 16,600 students at the university. The results overwhelmingly supported the concentrated discrimination account, challenging the view that the main problem is implicit bias.

In the survey studies, the students answered questions to measure their views on campus culture and their perception of peers' engagement in discriminatory conduct. The field experiments took place on campus. In each, the researchers observed students in a staged situation interacting with a confederate (an actor following a script) who was easily identifiable as belonging or not belonging to a marginalized group. The question was whether the students, who were unaware they were being observed, spontaneously behaved in a positive manner toward the confederate. For example, in the "door holding" experiment, a white or Black confederate followed students as they entered a campus building. The "focal" behavior, which both the confederate and an onlooking researcher recorded, was holding the door. Other focal behaviors examined were providing directions, helping to pick up dropped note cards and choosing a seat on a bus. In an additional set of field experiments, researchers responded to job ads, sending the contact person for each job two resumés and cover letters: one with a prototypically white name (for example, Cody Miller) and the other with a name more typical for a particular marginalized group (for example, DeShawn Washington for a Black candidate). The focal behaviors for the contact person were responding at all, requesting more information and inviting the applicant for an interview.

Campbell and Brauer reasoned that if the dispersed discrimination account was correct, marginalized students would report having generally negative attitudes about campus and peers, and much smaller percentages of students would exhibit the positive focal behaviors (holding the door, providing directions, and so on) when interacting with a marginalized confederate. In contrast, if the concentrated discrimination account was correct, they theorized, the results would be the opposite: marginalized students would report generally positive attitudes about campus climate and peers in the surveys, and there would be small differences in the percentages of students exhibiting the focal behaviors toward the two types of confederates.

Jasmin Merdan/Getty Images (*preceding pages*)

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The survey results supported the concentrated discrimination account. In one survey, white students were more positive about campus climate than students of color were. Students of color were still generally positive in their ratings, however. For example, 64 percent of students of color indicated they felt respected on campus "very often" or "extremely often," compared with 83 percent of white students. As another example, 75 percent of students of color felt "very respected" or "extremely respected" by faculty and instructors in class, compared with 78 percent of white students. In another survey, at least 95 percent of students in each of three marginalized groups (students of color, LGBTQ students and students belonging to a minority religious group) indicated that a small percentage of their peers were responsible for discrimination observed on campus. Overall, the survey results indicated that discrimination is a problem on campus but that its likely cause is a numerical minority of highly prejudiced people.

The field experiments told the same story. Differences in students' treatment of marginalized and nonmarginalized confederates were small even when they were statistically significant. For example, in the door-holding experiment, 87 percent of students held the door for a white confederate, versus 82 percent who did so for a Black confederate. (The student population is majority white, but the studies observed the behavior of any students who encountered the confederates.) Similarly, in the asking-directions experiment, 92 percent of students were willing to provide directions to a "lost" confederate who was white, versus 83 percent who did so for a confederate who was Asian and 86 percent who did so for one who was Muslim (a white woman wearing a hijab).

In one of the resumé studies, "Cody Miller" received a reply 63 percent of the time, and "DeShawn Washington" received one 54 percent of the time. The implication of these findings is that, in the types of situations examined, a small percentage of people on campus would act positively toward a white person but negatively toward a marginalized person. Overall, the results were roughly in line with the Pareto principle, which states that for many events, such as crimes or traffic accidents, around 80 percent of the effects come from 20 percent of the causes.

Campbell and Brauer emphasize that their findings in no way imply that discrimination is not a serious problem or that claims of discrimination are exaggerated. They further argue that prodiversity interventions can work but only if they take into account "the reality of discrimination in a particular setting: how many individuals engage in discrimination and what forms this discrimination takes." If, for example, a small number of explicitly prejudiced people are responsible for most or all of the discrimination occurring in a company, an intervention that requires all employees to undergo implicit bias training will probably fail to address the problem. Research suggests that interventions that convey the message that nearly everyone engages in discriminatory behavior may even make the workplace atmosphere worse for marginalized employees because after the training, nonmarginalized employees may avoid interacting with them out of fear of unwittingly committing discrimination.

The study has a number of limitations. Marginalized students with highly negative opinions of campus may have chosen not to complete the surveys. The field experiments examined behaviors in which little effort was required on the part of students to help the confederates. It could be that the dispersed discrimination account would be supported by experiments involving behaviors that require greater effort. The studies were conducted on a university campus where many students express egalitarian beliefs and there are strong norms against prejudice and discrimination. It is possible that the dispersed discrimination account would be supported in other settings. The research also did not examine all the behaviors that can undermine members of marginalized groups in different situations, such as use of offensive language. As a final caveat, this work examined individual acts of discrimination that students might encounter and did not address structural bias in health care, education, policing, housing, or other areas.

Understanding the causes of discrimination in all of its repugnant forms is an urgent goal for psychological science.

Understanding the causes of discrimination in all of its repugnant forms is an urgent goal for psychological science. In recent years the view that most people engage in discriminatory acts because of implicit biases has gained widespread public acceptance. In a 2016 presidential debate, Hillary Clinton commented that "implicit bias is a problem for everyone."

Campbell and Brauer's findings suggest it's still not clear the extent to which implicit biases explain discriminatory conduct. (Other work has called into question the validity of implicit bias measures for predicting real-world discrimination.) Research aimed at answering this fundamental question will inform the design of interventions that may one day meaningfully reduce levels of discrimination. SA

David Z. Hambrick is a professor in the department of psychology at Michigan State University. His research focuses on individual differences in cognition and the development of expertise.

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How to Think about Implicit Bias

The phenomenon is real—and it matters

By Keith Payne, Laura Niemi and John M. Doris

WHEN'S THE LAST TIME A STEREOTYPE POPPED INTO YOUR MIND? If you are like most people, the authors included, it happens all the time. That doesn't make you a racist, sexist or whatever-ist. It means your brain is noticing patterns and making generalizations. But the same thought processes that make people smart can also make them biased. This tendency for stereotype-confirming thoughts to pass spontaneously through our minds is what psychologists call implicit bias. It sets people up to overgeneralize, sometimes leading to discrimination even when people feel they are being fair.

Studies of implicit bias have drawn ire from both the right and the left. For the right, talk of implicit bias is just another instance of progressives seeing injustice under every bush. For the left, implicit bias diverts attention from more damaging instances of explicit bigotry. Debates have become heated and have leaped from scientific journals to the popular press. Along the way, some important points have been lost. We highlight two misunderstandings that anyone who wants to understand implicit bias should know about.

First, much of the controversy centers on the most famous implicit bias test, the Implicit Association Test (IAT). A majority of people taking this test show evidence of implicit bias, suggesting that most individuals are implicitly biased even if they do not think of themselves as prejudiced. As with any measure, the test does have limitations. The stability of the test is low, meaning that if you take the same test a few weeks apart, you might score very differently. And the correlation between a person's IAT scores and discriminatory behavior is often small.

The IAT is a measure, and it doesn't follow from a particular *measure* being flawed that the *phenomenon* we are attempting to measure is not real. Drawing that conclusion is to commit the Divining Rod Fallacy: just because a rod doesn't find water doesn't mean there's no such thing as water. A smarter move is to ask, "What does the other evidence show?"

In fact, there is lots of other evidence. There are perceptual illusions, for example, in which white subjects perceive Black faces as angrier than white faces with the same expression. Bias can cause people to see harmless objects as weapons when they are in the hands of Black men and to dislike abstract images that are paired with Black faces. And there are dozens of variants of laboratory tasks finding that most participants are faster to identify bad words paired with Black faces than with white faces. None of these measures is without limitations, but each shows the same pattern of reliable bias as the IAT. There is a mountain of evi-

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dence—independent of any single test—that implicit bias is real.

The second misunderstanding is about what scientists mean when they say a measure predicts behavior. One frequent complaint is that an individual's IAT score doesn't tell you whether the person will discriminate on a particular occasion. This is to commit the Palm Reading Fallacy: unlike palm readers, research psychologists aren't usually in the business of telling you, as an individual, what your life holds in store. Most measures in psychology, from aptitude tests to personality scales, are useful for predicting how *groups* will respond *on average,* not forecasting how particular *individuals* will behave.

The difference is crucial. Knowing that an employee scored high on conscientiousness won't tell you much about whether their work will be careful or sloppy if you inspect it right now. But if a large company hires hundreds of employees who are all conscientious, this will likely pay off with a small but consistent increase in careful work on average.

Implicit bias researchers have always warned against using the tests for predicting individual outcomes, such as how a particular manager will behave in job interviews—they've never been in the palm-reading business. What the IAT does, and does well, is predict average outcomes across larger entities such as counties, cities or states. For example, metro areas with greater average implicit bias have larger racial disparities in police shootings. And counties with greater average implicit bias have larger racial disparities in infant health problems. These correlations are important: the lives of Black citizens and newborn Black babies depend on them.

Field experiments demonstrate that real-world discrimination continues and is widespread. White applicants get about 50 percent more callbacks than Black applicants with the same résumés; college professors are 26 percent more likely to respond to a student's e-mail when it is signed by Brad rather than Lamar; and physicians recommend less pain medication for Black patients than for white patients with the same injury.

Today managers are unlikely to announce that white job applicants should be chosen over Black applicants, and physicians don't declare that Black people feel less pain than white people. Yet the broad pattern of discrimination and disparities seen in field studies persists. It bears a much closer resemblance to the widespread stereotypical thoughts seen on implicit bias tests than to results of survey studies in which most people present themselves as unbiased.

One reason people on both the right and the left are skeptical of implicit bias might be pretty simple: it isn't nice to think we aren't very nice. It would be comforting to conclude, when we don't consciously entertain impure intentions, that all of our intentions are pure. Unfortunately, we can't conclude that: many of us are more biased than we realize. And that is an important cause of injustice—whether you know it or not. SA

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OPINION

Disinformation Campaign

The election of anti-CRT candidates demonstrates how exploiting white fear continues to galvanize voters

By Daniel Kreiss, Alice Marwick and Francesca Bolla Tripodi

Illustration by Brian Stauffer

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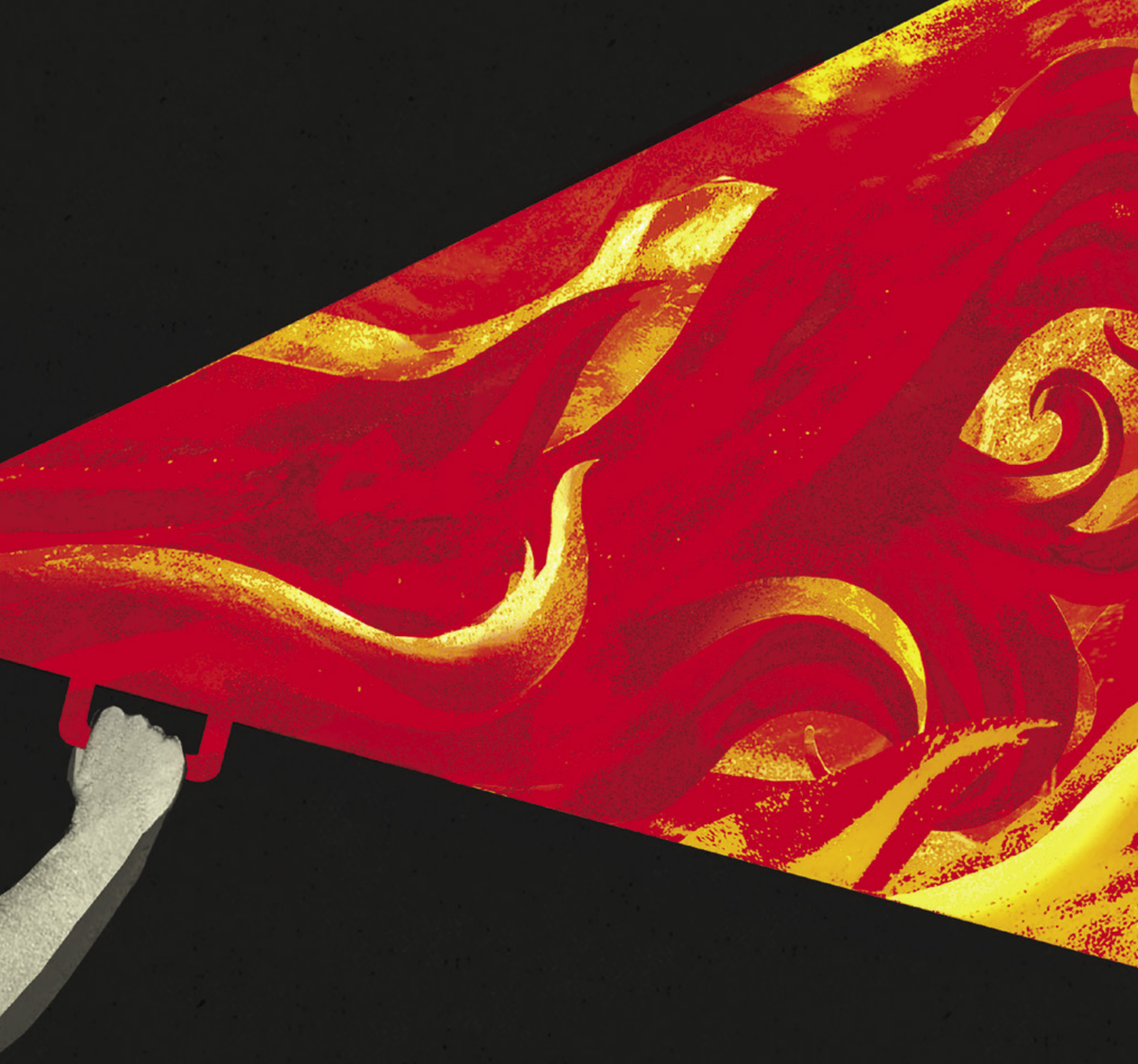

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GLENN YOUNGKIN WAS ELECTED GOVERNOR OF VIRGINIA BASED IN PART ON HIS anti–critical race theory platform. His 2021 campaign and others like it continue a long-standing conservative disinformation campaign of falsehoods, half-truths and exaggerations designed to create, mobilize and exploit anxiety around white status to secure political power. The problem is, these lies work, and that shows that liberals have a lot of work to do if they want to come up with a successful countermessage.

Conservatives have spent close to a century galvanizing white voters around the "dangerous" idea of racial equality. When such disingenuous rhetoric turns into reality, the end result is the criminalization of educational programs that promote racial equality. Youngkin, who pledged to "ban critical race theory on Day One," frequently repeated this promise at his "Parents Matter" rallies across the state in the final months of the campaign.

But in his campaigning, he and others misrepresented what critical race theory (CRT) actually is: a specialized intellectual field established in the 1980s by legal scholars Kimberlé Crenshaw, Neil Gotanda and Stephanie Phillips that emphasizes the unique historical role that legal systems play in upholding and producing racial inequalities in the U.S.

Conservatives instead framed CRT as nearly anything taught in schools that would discuss racial inequality. Youngkin's appeals targeted white suburban voters by creating fears of these kinds of lessons. He promised to implement the supposedly color-blind values of Martin Luther King, Jr., replace the entire Virginia board of education and install a curriculum based on the 1776 Project, an education initiative by Donald Trump that has been heavily criticized by historians for trafficking in jingoistic mythology.

Democrats have not successfully countered this disinformation campaign or accurately reflected on its history. Indeed, in response to charges of reverse racism and the subversion of parent rights and parental say, Democrats argued that none of the things criticized by Republicans are actually part of CRT. Clearly, these kinds of logical appeals are not working.

This is in part because campaigns such as Youngkin's are built on a legacy of lies dating back to the 1950s and 1960s. Our research demonstrates that conservative fearmongering over CRT reuses a set of scare tactics that equate racial justice with Communism that originated during the cold war. Conservative politician George Wallace once called the Civil Rights Act of 1964 "a fraud, a sham, and a hoax" and likened it to the Communist Manifesto. Indeed, whereas today's conservatives strategically misuse King's values to justify colorblindness in the service of inequality, their 1950s predecessors labeled King an "outside agitator" and used fears of Communism to rationalize physical violence against civil rights groups.

Even in a post-Soviet world, fears of Communism are evergreen. On May 24, 2021, Christopher Rufo, a key figure in the anti-CRT movement, tweeted that "American schools haven't 'whitewashed' history; they've 'redwashed' it." The 1776 Project PAC, which opposes CRT and backed candidates in 58 races around the country, argues that advocates of racial justice "believe we need to undo the cornerstones of American society including classical liberalism, legal reasoning, and capitalism in order to promote their version of cultural Marxism based on race rather than class."

Republican think tanks, thought leaders, media figures and politicians such as Youngkin draw on this legacy to brand any diversity, equity and social justice initiative as the dangerous (and Communist) "critical race theory."

Conservative anti-CRT rhetoric and the accompanying bills introduced and enacted by Republican state legislatures across the country constitute a disinformation campaign designed to manufacture white grievance in the service of white power. These policies reveal the need for researchers and scholars concerned with the quality of democratic debate to treat white supremacy as a disinformation campaign and to incorporate an honest accounting of America's racial history and legacy of present-day inequality into all levels of education.

Anti-CRT efforts offer a sweeping, bad-faith indictment of any attempt to do so on the grounds that it is "reverse racism," will make white kids feel bad for being white and will further divide the nation.

These claims are not true, but many white people believe them because of a systematic disinformation campaign carried out by

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GLENN YOUNGKIN speaks during a campaign stop at the Alexandria Farmers Market in Alexandria, Va., on October 30, 2021.

Anna Moneymaker/Getty Images

Republican politicians, media and thought leaders. For example, conservative viewpoints on CRT dominate search returns, as one of us (Tripodi) has testified to the U.S. Senate; this is the product of a concerted campaign to shape publicly available information. Search "What is CRT?" on YouTube, and the content with the most engagement is from PragerU, a nonuniversity whose goal is to spread conservative views and values. Produced just last year, this five-minute explainer video has almost two million views.

Elections never depend on a single factor, and it's not unusual for the party that captures the presidency to lose ground. That said, the perceived success of conservatives' anti-CRT campaign is likely to further legitimate explicit appeals to white people such as those famously used by Trump. This will probably have long-lasting consequences. It further organizes U.S. politics around hardened racial and ethnic coalitions: a majority-white Republican Party and a multiethnic, multiracial Democratic Party. The Republican Party promises to maintain white people's status at the top of the social hierarchy, and anti-CRT rhetoric conveys that this is *justifiable*.

The perceived success of anti-CRT campaigns also jeopardizes any meaningful discussions of systemic inequality as part of public school education. As of March 2022, 16 states had passed anti-CRT legislation, and another 19 were considering similar bills or policies. These bills have the practical effect of preventing even tacit acknowledgment of racism or sexism. A bill passed by the Wisconsin Assembly, for instance, bans any books, educational materials or classroom discussions that include terms such as "racial prejudice," "patriarchy," "structural inequality," "intersectionality" or, ironically, "critical self-reflection." With this rule in place, it is hard to see how the Civil Rights Movement, women's suffrage, or any number of events in American history could be discussed at all, let alone in depth. Indeed, such legislation may effectively "chill" the teaching of race by teachers scared to run afoul of conservative politics.

Many white voters are reacting en masse to fears that children will be taught about white privilege and white supremacy, even as conservative pundits and politicians rely on tried-and-true anxieties over Communism to paint antiracist efforts as a threat to capitalism and America as a whole. Unfortunately, we know from history that white racial mobilization is a potent force, both at the ballot box and in attempts to subvert it.

This disinformation campaign must be directly confronted. Rather than dismissing manufactured concerns over CRT as fake, Democrats should embrace the robust teaching of America's racial history in our public schools and make an affirmative case for why it matters for American values of fairness, equality and justice. Democrats should then focus on articulating how attacks on CRT are meant to divide people of all races who otherwise share interests. Rather than dismissing these attacks as isolated incidents, Democrats should mount their own sustained and coherent campaign to argue affirmatively for diversity, equity and inclusion programs and for complementary efforts such as the 1619 Project.

Conservatives are unified around anti-CRT rhetoric. Now it is time for Democrats to form the same united front, to own that racism is real and to call out conservative legislative efforts designed to outlaw the teaching of racial inequality for what they are: a fitting example of how legal systems uphold racial inequality in the U.S. This, of course, is exactly what CRT is trying to point out. SA

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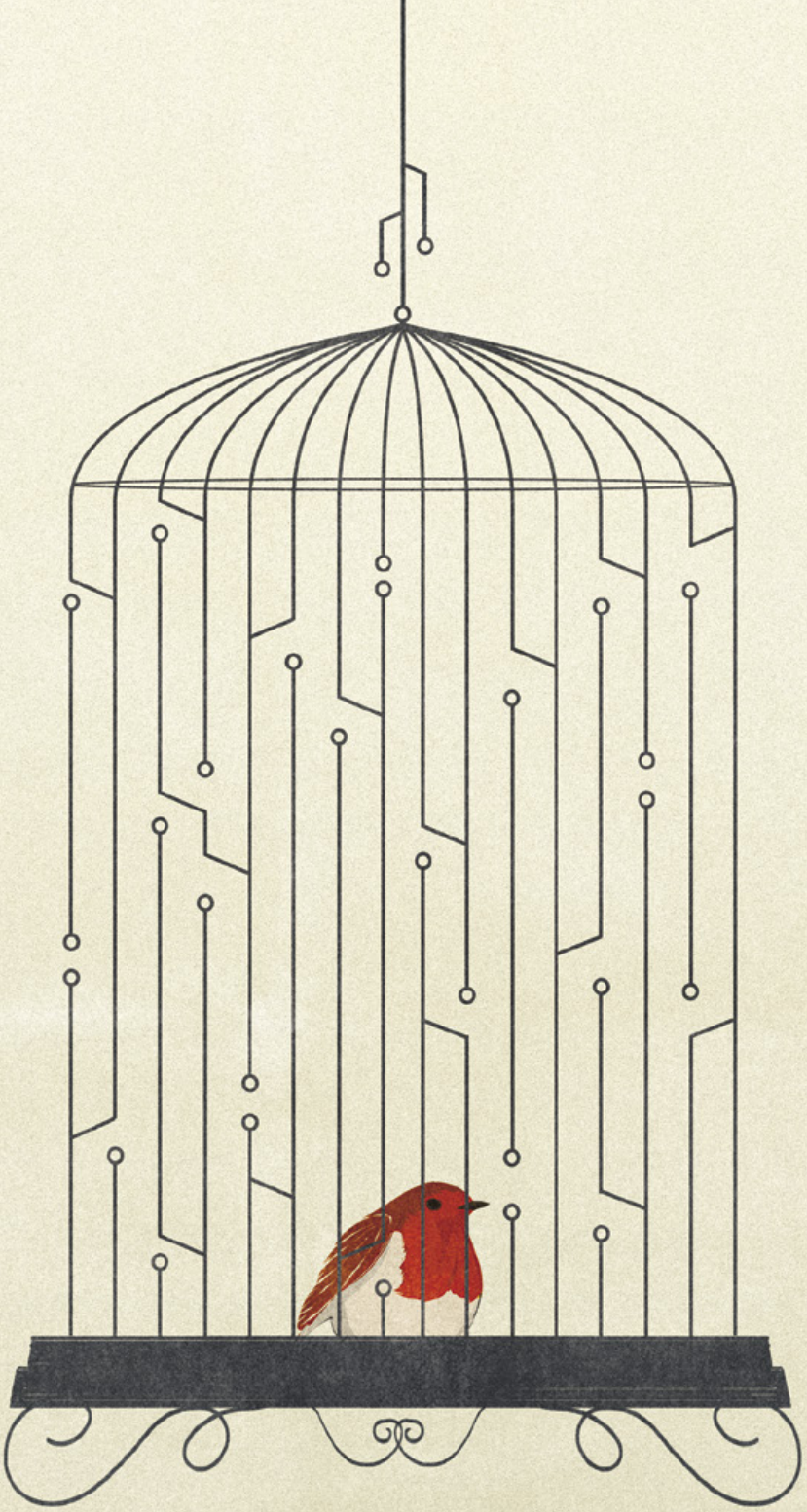

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The Harm That Data Do

Learning from protests against algorithmic systems worldwide is key to a just and equitable future

By Joanna Redden

In Australia, they called it "robo debt": an automated debt-recovery system that generated fear, anxiety, anger and shame among those who rely on, or who have relied on, social support. In 2016 the country's Department of Human Services introduced a new way of calculating the annual earnings of welfare beneficiaries and began dispatching automated debt-collection letters to those identified as having been overpaid. The new accounting method meant that fortnightly income could be averaged to estimate the income for an entire year—a problem for those with contract, part-time or precarious work. Reports indicate that the system went from sending out 20,000 debt-collection notices a year to sending up to that many every week.

Previously, when the system identified someone who may have been overpaid benefits, a human was tasked with investigating the case. Under the automated system, however, this step was removed; instead it became the responsibility of the recipients to prove that they had not. That meant finding out why they were targeted—often requiring hours on the phone—and digging up copies of pay slips from as far back as seven years. To make matters worse, many of the debt notices were sent to people already living in difficult situations. Those targeted felt powerless because they had little time or resources to challenge the

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system. Newspapers reported at least one suicide. A social service organization eventually reported that a quarter of the debt notices it investigated were wrong, and an Australian senate inquiry concluded that "a fundamental lack of procedural fairness" ran through the entire process. In 2019, after years of activism, civil-society mobilization, and political and legal challenges, a judge ruled the system unlawful, and a class action lawsuit was settled in 2020 for $1.2 billion.

We have entered an "age of datafication" as businesses and governments around the world access new kinds of information, link up their data sets, and make greater use of algorithms and artificial intelligence to gain unprecedented insights and make faster and purportedly more efficient decisions. We do not yet know all the implications. The staggering amount of information available about each of us, combined with new computing power, does, however, mean that we become infinitely knowable—while having limited ability to interrogate and challenge how our data are being used.

At the Data Justice Lab at Cardiff University in Wales, we maintain a Data Harm Record, a running log of problems with automated and algorithmic systems being reported from across the globe. We analyze this record to understand the diverse ways in which such systems are going wrong, how citizens' groups are dealing with the emerging problems, and how government agencies and legal systems are responding to their challenges. Our studies, we hope, will result in a deeper understanding of how democratic institutions may need to evolve to better protect people—in particular, the marginalized—in the age of big data.

DEEPENING INEQUALITY

THE ROBO-DEBT SCANDAL is one of many that demonstrate the power imbalance incorporated into many emerging data systems. To understand what happened, we need answers to such questions as why a system with such high error rates was introduced without adequate due process protections for citizens, why robust impact assessments were not done before it was rolled out, why the needs of those affected were not fully considered in designing the online portal or help line, and why it was deemed permissible to remove human oversight. The problems with it, and with many other data-driven systems, stem in significant part from underlying social and political contexts—specifically, long-standing binaries of "deserving" and "undeserving" citizens that influence how they are valued and treated.

The fact is that some amount of error is inevitable in automated systems, as mathematician Simon Williams of the University of Melbourne in Australia pointed out with regard to the robo-debt case: there always will be false positives and false negatives, and such discrepancies should lead to far greater review, as well as investigation of impact and debate before implementation of such programs.

Research by Joy Buolamwini of the M.I.T. Media Lab has been central to influencing corporate and government bodies to rethink their use of face-recognition technologies. In 2016 Buolamwini founded the Algorithmic Justice League. Her Gender Shades research, conducted with Timnit Gebru, finds that face-recognition technologies routinely demonstrate both skin-type and gender biases. The systems studied most accurately identify white men and show higher error rates for darker skin tones, with the highest error rates for women with darker skin. These error rates are a particular problem given that such systems can influence your ability to travel or access government services or can lead to wrongful arrest. Buolamwini argues that system errors happen, in part, because the machine-learning algorithms are trained on data sets containing mainly white faces. Employees at the high-tech firms that designed these systems are, mostly, white—an imbalance that can limit the ability to spot and address bias.

Likewise, an investigation by news organization ProPublica discovered that algorithms predicting the likelihood that someone charged with a crime would reoffend were twice as likely to falsely rank Black defendants as high risk than white defendants. Similar scoring systems are being used across the U.S. and can influence sentencing, bonds and opportunities to access rehabilitation instead of jail. Because the models are proprietary, it is difficult to know why this happens, but it seems to be connected to weights the algorithms assign to factors such as employment, poverty and family history. Data drawn from a world that is unequal will reflect that inequality and all too often end up reinforcing it.

Disturbingly, researchers find that those at the top—the designers and the administrators—routinely fail to appreciate the limitations of the systems they are introducing. So, for example, the underlying data sets might contain errors, or they could have been compiled from other data sets that are not particularly compatible. Often, too, the implementers are unaware of bureaucratic or infrastructural complexities that can cause problems on the ground. They routinely fail to assess the impact of the new systems on marginalized people or to consult with those who do have the necessary experience and knowledge. When algorithms replace human discretion, they eliminate corrective feedback from those affected, thereby compounding the problem.

At other times, harm results from the way big data are used. Our data "exhaust"—the data we emit as we communicate online, travel and make transactions—can be combined with other data sets to construct intimate profiles about us and to sort and target us. People can be identified by religion, sexual preferences, illnesses, financial vulnerability, and much more. For example, World Privacy Forum's Pam Dixon found data brokers (the companies that aggregate and sell consumer data) offering a range of problematic lists, such as of individuals suffering from addictive behavior or dementia and rape victims, among others. Researchers studying the financial crash of 2008 found that banks had combined offline and online data to categorize and influence customers. In 2012 the U.S. Department of Justice reached a $175-million settlement with Wells Fargo over allegations that it had systematically pushed Black and Hispanic borrowers into more costly loans.

Overall, the kinds of damage that data systems can cause are incredibly diverse. These may include loss of privacy from data breaches; physical injury as workplace surveillance compels people to take on more than they can; increased insurance and interest rates; and loss of access to basic essentials such as food, home care and health care. In unequal societies, they serve to further embed social and historical discrimination.

DISSENT AS NECESSITY

WHAT HAPPENS when people try to challenge data harms? To date, we have investigated cases involving governmental use of

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new data systems in Australia, Canada, the Netherlands, New Zealand, the U.K. and the U.S. Even in these democratic societies, relying on legal systems alone can take years, in the meantime draining precious energy and resources while families are thrown into crisis. Citizens are combining their time and other resources into a collective and multipronged effort that includes all the pillars of democracy.

In the robo-debt case, those affected created a Not My Debt campaign for publishing their stories anonymously, getting help and sharing resources. According to Dan Nicholson, Victoria Legal Aid's executive director of criminal law, the organization struggled to initiate a federal court challenge, in part because people were reluctant to go public after the Department of Human Services released the private details of one critic to the press. The organization did go on to successfully challenge the system in 2019. One of Nicholson's biggest concerns is how the government shifted responsibility to individual citizens for proving that no debt is owed, despite its vastly superior ability to compile evidence.

In the Netherlands, individuals and organizations came together to successfully launch a court challenge against the government over Systeem Risico Indicatie (SyRI), which linked citizens' data to predict who is likely to commit fraud. The litigants argued that the system violates citizens' rights by treating everyone as guilty until proven innocent. In 2020 a District Court of the Hague ruled that SyRI was in violation of the European Convention on Human Rights. This court case is likely to inspire citizens in other democracies seeking to protect their rights and to expand the definitions of harm.

In the U.K., groups such as defenddigitalme are raising concerns about the psychological and social impact of Web-monitoring software in schools and the ways it can damage students who are wrongly labeled, for instance, as being suicidal or as gang members. In New Zealand, nongovernmental organizations (NGOs) successfully blocked an attempt by the Ministry of Social Development to require all providers of social services to provide data about their clients to receive government funding. The NGOs argued that the requirement could prompt members of already marginalized groups, such as refugees or victims of domestic violence, to avoid help for fear of being identified.

In Little Rock, Ark., an algorithm introduced by the state's Department of Human Services was blamed for unjustly cutting the home care hours of people with severe disabilities. Earlier, home care nurses determined home care hours. After the change, they helped people fill out a questionnaire and entered the data into a computer system—and the algorithm decided. Government representatives argued that the automated system ensures that assignments of home care hours are fair and objective. Some individuals strongly disagreed, and with the help of Legal Aid of Arkansas, seven of them took the department to court. Six had seen their weekly home care hours cut by more than 30 percent. Court documents make for grim reading, with each plaintiff recounting the impact of the cuts on their life and health.

Examining information about the algorithm extracted via a court order, Legal Aid of Arkansas lawyer Kevin De Liban found numerous problems with it and how it was implemented. In May 2018 a judge ordered the Department of Human Services to stop using it, but the agency refused—whereupon the judge found the department in contempt. The challenge was ultimately successful, with the agency stopping use of the algorithm in 2018.

These cases speak to the importance of collective mobilization in protecting people from injustices committed via data systems. It is difficult for individuals, with relatively limited resources or access to inside information about data systems, to interrogate the systems alone or to seek redress when they are harmed. Apart from instigating collective challenges, broader public discussion is needed about the transparency, accountability and oversight of data systems required for protecting citizens' rights. Further, how should information about these new systems be communicated so that everyone can understand? What are governments' obligations to ensure data literacy? And are there no-go areas? Surely maps of where and how governments are introducing data systems and sharing people's data should, as a first step, be provided as a matter of democratic accountability.

The staggering amount of information available about each of us, combined with new computing power, does, however, mean that we become infinitely knowable—while having little ability to interrogate and challenge how our data are being used.

Just as important is ensuring that citizens can meaningfully challenge the systems that affect them. Given that datafied systems will always be error-prone, human feedback becomes essential. Critiques should be welcomed rather than fended off. A fundamental rethink of governance is in order—in particular, on questions of how data systems are part of longer histories of systemic discrimination and violence, of how dissent and collaboration are necessary to democratic functioning, and how both might be better fostered by public bodies and authorities in societies permeated by inequality and data.

Joanna Redden is co-director of the Data Justice Lab at Cardiff University in Wales and an assistant professor at Western University in Ontario.

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A Chilling Effect

I am a future psychiatrist hoping to provide care to transgender people. But I fear new anti-trans laws will make it difficult to do so

By Ashley Andreou

EVERY YEAR MARCH 31 MARKS TRANSGENDER DAY of Visibility, a day when we should be celebrating the accomplishments of people who are trans, honoring their resilience and advocating loudly for their rights. Yet the growing onslaught of anti-trans legislation targeting the health-care decisions that families make with their doctors threatens to cast a shadow over this day.

In 2021 I lost a family member to the mental trauma of transgender discrimination, so I speak from a place of watching someone I love suffer from lack of support. These recent and proposed laws, none of which are grounded in evidence-based medicine, will affect the mental and physical health of adults and children and the families who support them.

I am in medical school, and I plan to specialize in psychiatry with the hope of working with people who are transgender or nonbinary. Instead of making me feel empowered to serve, the intent behind these laws makes me fearful for my future patients. The directive in Texas that calls gender-affirming health care "child abuse" makes me afraid to practice and outraged that any state can insert itself into the clinical decision-making that we spend thousands of hours honing over several years. There are so few doctors who treat people who are transgender, let alone specialize in the physical and mental medicine specific to their needs. These laws could dissuade clinicians from entering this line of work.

Instead of enacting laws that deny the basic health rights of the trans community—and signal to trans individuals that they are not safe, accepted or supported—policy makers, clinicians and advocates need to work together to create laws that counteract and prevent the health disparities that are exacerbated by the enduring discrimination against this community.

One of the biggest points of misinformation in the lobbying for these laws is what constitutes gender-affirming health care. Gender-affirming care is defined as treatments that either delay the onset of physical changes associated with puberty or create physiological and physical changes that affirm one's gender identity (for example, hormone therapy or surgery). It is important to note that transitioning is a spectrum—not everyone who is transgender chooses hormone therapy, and not everyone chooses surgery. Yet all options are at stake with some of the laws that have passed or been proposed.

Doctors do not offer gender-affirming therapy rashly, and they prescribe puberty blockers only after working with a younger transgender person considering transition for a long time. Access to puberty blockers is critical because puberty's effects on certain body parts cannot be easily reversed by hormone therapy later in life (for example, testosterone's effects on voice). Altogether, the process requires coordinated counseling and medical oversight from a multidisciplinary clinical team that can include psychiatrists, endocrinologists and urologists, among others.

About 25 percent of transgender and nonbinary people choose gender-affirming surgery. Medical guidelines do not recommend surgery (such as facial reconstruction, mastectomy or phalloplasty) until a person is 18 years old, a point purposefully misrepresented by politicians who falsely say doctors are operating on young children.

More than 58,000 transgender teenagers who are transitioning are at risk of losing access to their medical care, according to a report from the University of California, Los Angeles, School of Law's Williams Institute. The effects of these bills and laws would be devastating. A large survey published in *Pediatrics* in 2018 found that 30 to 50 percent of young trans and nonbinary people reported a previous suicide attempt, compared with less than 9 percent of all adolescents. Experts hypothesize that this greater risk among trans youth is linked to internalized rejection and shame. In contrast, transgender youth who are supported by their families and receive gender-affirming care have markedly lower rates of depression: gender-affirming care has been associated with a nearly 40 percent reduction in depression and in attempting suicide in the past year. Furthermore, trans youth who have access to puberty suppressants have a much lower risk of lifetime suicide as adults.

As Texas's legislature debated anti-trans bills last year, the Trevor Project, an organization focused on LGBTQIA+ youth suicide prevention, received more than 10,800 total crisis contacts. Transgender or nonbinary youth made up more than 3,900 of those crisis contacts, and many of them reported feeling stressed, turning to self-harm and considering suicide as a result of the anti-LGBTQIA+ laws proposed by politicians in their state. Between 2020 and 2021, the Trevor Project recorded a 150 percent increase in LGBTQIA+ youth

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Transgender rights advocates hold pride flags during a rally against Ohio legislation banning transgender women from female sports in June 2021 in Columbus, Ohio.

in Texas contacting the organization in crisis and seeking support. As a future psychiatrist, I find it incomprehensible that state lawmakers would willfully harm the mental health of so many young people.

All this legislation is at direct odds with the medical guidance of the American Psychiatric Association, the American Medical Association (AMA) and the American Academy of Pediatrics (AAP). These medical organizations recommend these medications and procedures for transgender individuals because there is a corpus of scientific literature affirming their benefits when medically indicated. These treatments are far from new and untested: puberty blockers have been used in medical care since the 1990s.

Calling me a child abuser will not stop my future patients from seeking care. Similar to the effects of efforts to stop abortion, transgender people and their families are liable to turn to unregulated black market products outside of the purview of the Food and Drug Administration's monitoring of hormone product safety and quality. I can't fulfill the Hippocratic oath knowing that my inability to provide gender-affirming care might force patients into unsafe situations.

Numerous bills go on to propose criminalizing physicians if they provide hormone therapy to patients. In medical school, we had lectures on the importance of providing gender-affirming care, as well as panels specifically on the health-care experiences of transgender patients. The closure of Texas's only multidisciplinary clinic for transgender youth, GENECIS, in response to pressure from the governor is evidence of the stifling effect these laws are already having on medical professionals.

As highlighted by the pandemic, a dangerous risk factor for burnout among physicians is when they cannot control the health outcomes of their patients. Yet these bills go one step further, creating preventable negative health outcomes, and would introduce a new level of powerlessness and morale loss among providers. The AMA and AAP have both issued statements opposing recent anti-trans bills.

When speaking out against an anti-trans bill in Arkansas in 2021 Michele Hutchinson, a pediatrician at Arkansas Children's Hospital, said, "I guarantee you, if this bill passes, children will die. And I will call you guys every single time one does." In April of that year, that anti-trans bill passed.

The day when police came to my house to tell my family that my uncle was found dead from an overdose after years of struggling with her identity, I felt like I was living through a nightmare.

In the painful days after, I committed myself to partnering with transgender communities to provide medical care and advocacy. Yet as legislators continue to signal that they would rather see people like my uncle dead than happy, alive and thriving, my grief has not subsided. Reading Texas Governor Greg Abbott's letter declaring gender-affirmative care "child abuse" and understanding that a growing number of legislators seek to bar me and other physicians from providing lifesaving care, I know my family's nightmare hasn't ended.

Despite these legal battles underscoring the transgender community's perseverance in the face of harrowing challenges, suffering is not what Transgender Day of Visibility is about. Unfortunately, brazen and medically uninformed politicians denying basic human rights over binary ideas of gender have left us no choice but to rally and continue to fight. My uncle, who was a transgender woman but liked being called "uncle," deserved more in life. This is what I can do for her in death. SA

Ashley Andreou is a medical student at Georgetown University.

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OPINION

Death by a Thousand Cuts

The everyday slights, insults and offensive behaviors that people of marginalized groups experience in daily interactions cause real psychological harm

By Derald Wing Sue

MY RESEARCH AND WORK ON WHAT WE CALL "RACIAL MICROAGGRESSIONS" began through a series of lifelong experiences and observations of interpersonal racial encounters. For example, I am a second-generation Asian American, born and raised in the U.S. Yet despite that fact, I receive constant compliments for speaking "good" English. On crowded New York City subway trains, with all seats taken, I noticed that there would always be an empty one next to a Black passenger. These examples and countless other incidents are racial microaggressions.

Microaggressions are the everyday slights, insults, put-downs, invalidations and offensive behaviors that people of marginalized groups experience in daily interactions with generally well-intentioned people who may be unaware of their impact. Microaggressions are reflections of implicit bias or prejudicial beliefs and attitudes beyond the level of conscious awareness. Social psychologists have studied implicit bias for decades, along with the role it plays in human behavior. Almost any marginalized group can be the object of microaggressions. There are racial, gender, LGBTQ and disability microaggressions that occur daily toward these groups.

Most individuals who commit microaggressions view themselves as moral and decent human beings who never would consciously discriminate against another person. Yet it is important to acknowledge that none of us is immune from inheriting the racial, gender or sexual orientation biases of our society. Let us return to the two opening examples to understand more fully the manifestation, dynamics and impact of microaggressions.

Microaggressions often contain a "metacommunication" or hidden message to the target, which reveals a biased belief or attitude. Although the perpetrator believes that he or she is praising me for speaking good English, the underlying message to me is, "You are a perpetual foreigner in your own country. You are not a true American, because true Americans are light-skinned."

The reluctance to sit next to Black people on the subway is a message that "you are to be avoided because you are potentially dangerous, a criminal or up to no good." Many of my Black friends tell tales of how they enter an elevator with a single white female and how she tenses up, clutches her purse more tightly and moves away in fear.

Microaggressions often convey to targets the message that they are foreigners, criminals, dangerous, a threat or subhuman. Our research labels these messages as themes: for Asian Americans and Latinx Americans, that you are a perpetual alien in your own country; for Black people, that you might be a criminal; for people who identify as LGBTQ, that you're a sinner; and if you're a woman, that you can be sexually objectified.

The saying "sticks and stones may break my bones, but words will never hurt me" expresses a belief that microaggressions are harmless, small, trivial and insignificant. Critics of microaggression theory believe that we are "making a mountain out of a molehill" and that such incidents are no different from the everyday incivilities that a white person might experi-

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ence from a rude clerk. Our research, however, reveals major differences that account for their greater harmful and detrimental impact on people of color:

- Microaggressions are constant and continual in the life experience of people of color. They experience these offensive behaviors every day from the moment they awaken in the morning until they go to sleep at night and from the time they are born until they die.
- Microaggressions are cumulative, and any one offense or put-down may represent the straw that breaks the camel's back.
- Microaggressions are constant reminders to people of color that they are second-class citizens.
- Microaggressions are energy-depleting and lead to the concept of "racial battle fatigue."
- Microaggressions symbolize past historic injustices, such as the enslavement of Africans, the taking away of land from the Indigenous people of this country, and the incarceration of Japanese Americans during World War II.

These distinctions have led psychologists to refer to everyday slights or indignities experienced by people of color as "death by a thousand cuts." Far from being harmless and benign, microaggressions have a macro impact on targets. A whole body of research supports this conclusion. They increase stress in the lives of people of color, lower emotional well-being, increase depression and negative feelings, assail the mental health of recipients, impede learning and problem-solving, impair employee performance and take a heavy toll on the physical well-being of targets. Equally important are findings that microaggressions lower the standard of living of people of color and create inequities in employment, education and health care.

In closing, I share with you the words of Martin Luther King, Jr., from his "Letter from Birmingham Jail": "We will have to repent in this generation not merely for the hateful words and actions of the bad people but for the appalling silence of the good people." These words have led us to ask an important question: What can well-meaning allies and bystanders do to disarm and dismantle microaggressions they observe?

Our research team at Teachers College, Columbia University, has been studying and developing antibias education and training strategies called microinterventions. These are the everyday antibias actions that can be taken by targets, parents, significant others, allies and well-intentioned bystanders to counteract, challenge, diminish or neutralize individual and systemic expressions of prejudice, bigotry and discrimination.

We have been able to organize microinterventions into four strategic goals: (1) make the "invisible" visible, (2) educate the perpetrator, (3) disarm the microaggression, and (4) seek outside support and help. For those interested in our research venture, much of the information can be found in our 2020 *American Psychologist* article entitled "Disarming Racial Microaggressions: Microintervention Strategies for Targets, White Allies, and Bystanders."

As King says, silence and inaction in the face of moral transgressions are complicity and collusion. As a society, each of us has a moral responsibility to take action against bias and bigotry. SA

Derald Wing Sue is a professor of psychology and education at Teachers College, Columbia University. He is author of *Microaggressions in Everyday Life*, second edition (John Wiley, 2020), and *Microintervention Strategies: What You Can Do to Disarm and Dismantle Individual and Systemic Racism and Bias* (John Wiley, 2020).

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2

HEALTH IMPACTS OF INEQUALITY

26 The Health-Wealth Gap

32 Born Unequal

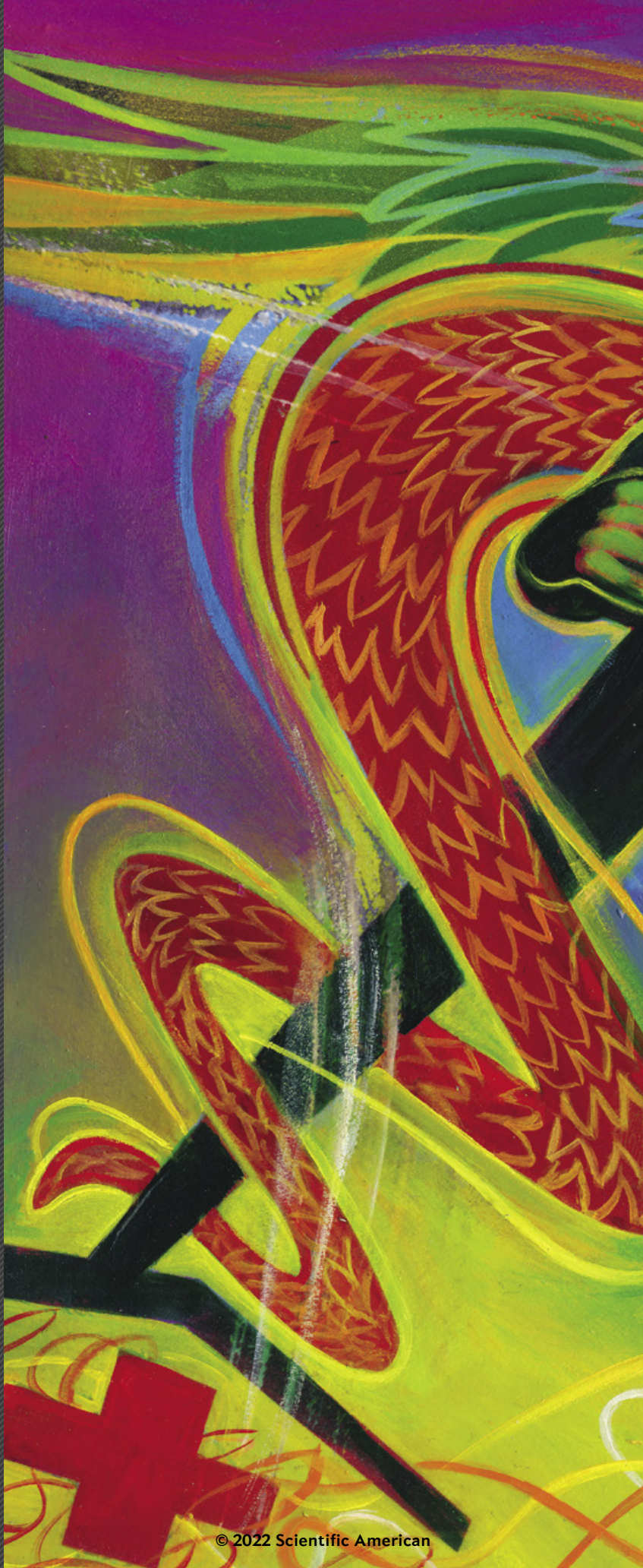
40 How to Reduce Maternal Mortality

44 Not Just for Men

50 Clinical Trials Need More Diversity

51 Racism in Medical Tests

Illustration by Rudy Gutierrez



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The Health-Wealth Gap

The growing gulf between rich and poor inflicts biological damage on bodies and brains

By Robert M. Sapolsky

WESTERN CULTURES HAVE LONG CHERISHED THE NOTION that all people are created equal. But in the real world, our lives are not balanced with equal opportunities and resources. This distinction was noted mordantly in 1894 by author Anatole France, who wrote that "the law, in its majestic equality, forbids the rich as well as the poor to sleep under bridges, to beg in the streets, and to steal bread." The rich, of course, need none of these things, whereas the poor often have little choice. And economic disparity has only gotten worse during the past several decades, particularly in the U.S. In 1976 the richest 1 percent of U.S. citizens owned 9 percent of the country's wealth; today they own about 30 percent. This trend echoes around the globe.

Illustration by Andrea Ucini

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One of the consequences for the growing poor is worsening health, and the reasons are not as obvious as you might think. Yes, lower socioeconomic status (SES) means less access to health care and living in more disease-prone neighborhoods. And, yes, as the SES ladder's lower rungs have become more populated, the number of people with medical problems has climbed. This is not merely an issue of poor health for the poor and some version of better health for everyone else. Starting with Elon Musk at the top, every step down the ladder is associated with worse health.

The link between socioeconomic inequality and poor health goes beyond simple access to care and living with more dangers. Fewer than half of the health changes along this SES/health ladder can be explained away by risks such as smoking, alcohol consumption and reliance on fast food or by protective factors such as insurance and health club memberships. In the U.K., large, long-term studies of risks in specific groups, led by epidemiologist Michael Marmot and called the Whitehall studies, demonstrated this clearly. Further, this ladder, or gradient, exists in nations with universal health care; if care availability were truly responsible, universal access should make the gradient vanish. Something else, something quite powerful, must be associated with inequities and be able to cause health problems.

That factor seems to be the stressful psychosocial consequences of low SES. Psychologist Nancy Adler of the University of California, San Francisco, and her colleagues have demonstrated that how people rate how they are doing, relative to others, is at least as predictive of health or illness as are any objective measures such as actual income level. The research indicates that poor health is as much about feeling poor as being poor. Epidemiologists Richard Wilkinson and Kate Pickett of the University of Nottingham and the University of York in England, respectively, have filled out this picture in detail, showing that while poverty is bad for your health, poverty amid plenty—inequality—can be worse by just about any measure: infant mortality, overall life expectancy, obesity, murder rates, and more. Health is particularly corroded by your nose constantly being rubbed in what you do not have.

Basically, more unequal societies have worse quality of life. Across countries and among U.S. states, more inequality, independent of absolute levels of income, predicts higher rates of crime, including homicide, and higher incarceration rates. Add in higher rates of kids being bullied at schools, more teen pregnancies and lower literacy. There are more psychiatric problems, alcoholism and drug use, as well as lower levels of happiness and less social mobility. And there is less social support—a steep hierarchy is the antithesis of the equality and symmetry that nourish friendship. This grim collective picture helps to explain the immensely important fact that when inequality increases, everyone's health suffers.

This is where the problem affects the rich, the haves, as well as the have-nots. With increasing inequality, they typically expend more resources insulating themselves from the world underneath the bridges. I have heard economist Robert Evans of the University of British Columbia call this the "secession of the wealthy." They spend more of their own resources on gated communities, private schools, bottled water and expensive organic food. And they give lots of money to politicians who help them maintain their status. It is stressful to construct thick walls to keep everything stressful out.

Knowing that these psychological and social factors influence the biology of disease is one thing. Demonstrating just how these stressors do their dirty work inside the body is something else. How do SES and inequality "get under the skin"? It turns out that researchers have made significant strides toward an answer. We have learned a lot about how poverty affects biology, and the part of the growing inequality gap that worries people is the poverty end. Scientists have been able to trace physiological connections from external inequality to three key inner areas: chronic inflammation, chromosomal aging and brain function.

A HEAVY LOAD

THINKING ABOUT the biology of disease was revolutionized in the 1990s, when the late Bruce McEwen of the Rockefeller University introduced the concept of allostatic load. Our bodies are constantly challenged by our environment, and we stay healthy when we meet those challenges and return to a baseline state, or homeostasis. Traditionally this view led scientists to focus on specific organs that solve specific challenges. Allostasis has a different perspective: physiological challenges provoke far-flung adaptations throughout the body. An infected toe, for instance, will produce not only inflammation at the tip of the foot but also wider changes in everything from energy taken from abdominal fat to the brain chemistry of sleepiness. As this biological grind continues, it leads to an array of body parts functioning less than optimally, which can be as damaging to health as a single organ gone very wrong.

Teresa Seeman of the University of California, Los Angeles, took this idea and followed it through the body, measuring various biomarkers of wear and tear, including increases in blood pressure, cholesterol, blood lipids, body mass index, molecular indicators of chronic hyperglycemia, and levels of stress hormones. She showed that this group of disparate measures powerfully predicts physical health and mortality.

Recent research by Seeman and others links low SES with heavy allostatic load because the body is in a constant and futile battle to return to a normal, nonstressed state. These findings highlight an important theme: whereas an adult's SES predicts allostatic wear and tear, childhood SES leaves a stronger lifelong mark. Low SES predisposes youngsters' bodies toward earlier "aging." The scientists also found protective factors. Although growing up in an impoverished neighborhood worsens the low SES–allostatic load link, lucking out with a mother who has the time and energy to be highly nurturing reduces the ill effects.

Stress in any form can produce these effects. It does not have to be related to money, but it is usually related to social situations. My own work with baboons living freely on the East African savanna has shown this effect. In baboon groups, an animal's place in the social hierarchy produces more or less stress. If you are a low-ranking baboon—a socially stressful situation—your body has unhealthy abnormalities in its secretion of glucocorticoids, which are stress hormones such as cortisol. The body also shows unhealthy changes in the gonadal, cardiovascular and immune systems.

In animal and human hierarchies, these stress-induced changes affect health through a key process: chronic inflammation. Few things are better examples of a double-edged biological sword than inflammation. After tissue injury, inflammation contains damage and initiates cell repair. Chronic widespread inflammation, however, causes molecular damage throughout the body, and studies have demonstrated that it contributes to diseases ranging from atherosclerosis to Alzheimer's. Recent

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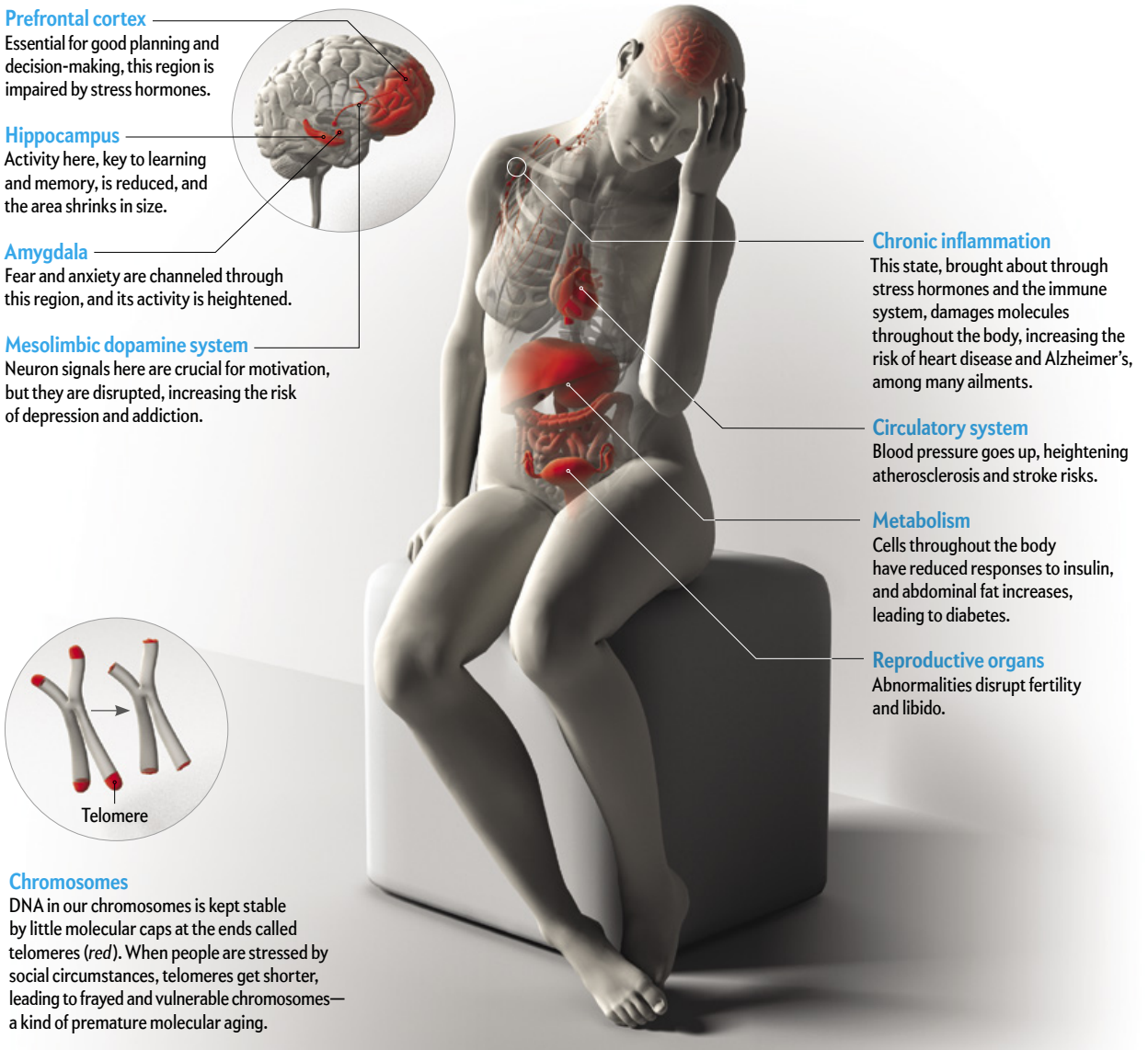
Inside Inequality

Life in societies with wide gaps between rich and poor creates ongoing social and psychological stresses. These grind down the body in a host of unhealthy ways, affecting our brains, our immune systems and our DNA, according to a broad range of research. Here are some effects that can lead to serious physical illnesses and mental problems.


Prefrontal cortex
Essential for good planning and decision-making, this region is impaired by stress hormones.
Hippocampus
Activity here, key to learning and memory, is reduced, and the area shrinks in size.
Amygdala
Fear and anxiety are channeled through this region, and its activity is heightened.
Mesolimbic dopamine system
Neuron signals here are crucial for motivation, but they are disrupted, increasing the risk of depression and addiction.
Chronic inflammation
This state, brought about through stress hormones and the immune system, damages molecules throughout the body, increasing the risk of heart disease and Alzheimer's, among many ailments.
Circulatory system
Blood pressure goes up, heightening atherosclerosis and stroke risks.
Metabolism
Cells throughout the body have reduced responses to insulin, and abdominal fat increases, leading to diabetes.
Reproductive organs
Abnormalities disrupt fertility and libido.
Telomere
Chromosomes
DNA in our chromosomes is kept stable by little molecular caps at the ends called telomeres (*red*). When people are stressed by social circumstances, telomeres get shorter, leading to frayed and vulnerable chromosomes—a kind of premature molecular aging.

work (including my own focusing on inflammation of the nervous system) indicates that chronic high stress levels can promote chronic inflammation. In people, childhood poverty upregulates the adult body's proinflammatory set point, with increased expression of inflammatory genes and increased levels of inflammatory markers such as C-reactive protein, which is associated with a higher risk of heart attacks.

These are long-term effects: more financial losses in the Great Recession predict higher C-reactive protein levels six years later. Humans share such vulnerabilities with other primates that live in unequal circumstances. Work by Jenny Tung of Duke University shows more markers of chronic inflammation in low-ranking rhesus monkeys compared with the socially dominant animals in a group. Such studies highlight the directness of the link between social stress factors and unhealthy biology because that link occurs in a species that lacks changes in lifestyle risk factors, such as increased rates of smoking and drinking, that we often see in humans who are stuck in low-status situations.

PREMATURE DNA AGING

PROGRESS in understanding the routes into the body taken by the SES/health gradient has also come through a very sensitive

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The Health of Nations and States

Health and social problems grow as income disparities widen within societies. Epidemiologists Richard Wilkinson and Kate Pickett demonstrated this connection in their 2009 book *The Spirit Level.* They ranked countries by an economic measure from the United Nations called the 20:20 ratio, which compares how much richer the top 20 percent of people are than the bottom 20 percent. As the gap widened, a combined index of life expectancy, infant mortality, mental health issues, obesity and other problems got worse. Average income does not explain this trend. In U.S. states, researchers found a similar effect. They ranked states using a U.S. Census Bureau measure called the Gini coefficient, which compares incomes among all population members, not just select groups. Again, the trend of bad health effects strongly followed inequality and could not be explained by average income in a state.

Health and social problems are worse in countries with more income inequality
Index of Health and Social Problems
Worse
Better
Overall trend
Low
High
Income Inequality, 2005 (20:20 ratio)
Higher average income levels in countries do not mean better health
GDP per Capita, 2005 (U.S. dollars, at purchasing power parity)
U.S. states also show worse health and social problems as income inequality climbs
Income Inequality, 1999 (Gini coefficient)
U.S. states with higher average incomes rarely show improved health
Per Capita Income, 1999 (dollars)

Index of Health and Social Problems includes these components:

- Life expectancy
- Teenage births
- Obesity
- Mental health
- Homicides
- Imprisonment
- Trust/mistrust
- Education
- Infant mortality rate
- Social mobility (for country level only)

measure of aging: the condition of telomeres, which are the stretches of DNA at the very tips of chromosomes.

Telomeres help to keep our chromosomes stable—molecular biologists like to say that they resemble the plastic caps at the ends of shoelaces that prevent fraying. Every time chromosomes are duplicated for cell division, the telomeres shorten; when they get too short, cells can no longer divide, and they lose many of their healthy functions. Telomere shortening is countered by the enzyme telomerase, which rebuilds these tips. Thus, the state of a cell's telomeres tells much about its biological "age," and shortened telomeres that produce frayed, vulnerable chromosomes seem to be a molecular version of wear and tear.

Telomere biology met stress physiology in a 2004 study led by health psychologist Elissa Epel and molecular biologist Elizabeth Blackburn, then both at U.C.S.F.; Blackburn won a Nobel Prize in 2009 for her pioneering work on telomeres. They examined 39 people who lived with severe stress every day: women who were caregivers for chronically ill children. The landmark finding was that white blood cells in these caregivers had shortened telomeres, decreased telomerase activity, and elevated oxidative damage to proteins and enzymes. (Oxidation can disable telomerase.) The longer a child's illness, the more stress the women reported and the shorter their telomeres were, even after the researchers accounted for potentially confounding factors such as diet and smoking. Telomeres normally shorten at a more or less constant rate in people, and calculations showed that these women's telomeres had aged roughly an additional decade—and sometimes more—past those in the low-stress group.

This discovery triggered a flood of supporting studies showing that stressors that include major depression, post-traumatic stress disorder and the experience of racial discrimination can all accelerate telomere shortening. Unsurprisingly, lower childhood SES also predicts shorter telomeres in adulthood; perceived poor neighborhood quality, witnessing or experiencing violence, family instability (such as divorce, death or incarceration of a parent), and other features of poor status early on are tied to these shrunken chromosome tips later in life. Spend your childhood in poverty, and by middle age your telomeres will probably be about a decade older than those of people with more fortunate childhoods.

Thus, from the macro level of entire body systems to the mi-

The Spirit Level: Why Greater Equality Makes Societies Stronger, by Kate Pickett and Richard Wilkinson. Bloomsbury, 2009; Bureau of Economic Analysis, U.S. Department of Commerce (*U.S. income per capita data*); *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World.* United Nations Development Program, 2007 (*GDP per capita data*)

Graphic by Jen Christiansen

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cro level of individual chromosomes, poverty finds a way to produce wear and tear. Most studies of telomere length compare "poor" with "non-poor," as do the studies comparing allostatic load, but the few studies that examine the whole spectrum of inequality, step by low-status step, show that every rung down the SES ladder most likely worsens these biological markers of aging.

OUT OF CONTROL

SLIPPING DOWN these rungs also changes the brain and behavior, according to a slew of recent neurobiological studies. My laboratory has devoted more than a quarter of a century to studying what ongoing stress does to the brain in rodents, monkeys and humans. Along with other labs, we have learned that one hotspot is the hippocampus, a region critical to learning and memory. Sustained stress or exposure to excessive glucocorticoids impairs memory by lowering hippocampal excitability, retracting connections between neurons and suppressing the birth of new neurons. In the amygdala, a brain area that is central to fear and anxiety, stress and glucocorticoids heighten those two reactions. Instead of damping things down as they do in the hippocampus, in this fear-promoting region they increase excitability and expand neuronal connections. Together these findings help to explain why post-traumatic stress disorder atrophies the hippocampus and enlarges the amygdala. Another affected area is the mesolimbic dopamine system, which is crucial to reward, anticipation and motivation. Chronic stress disrupts that system, and the result is a predisposition toward the anhedonia of depression and vulnerability to addiction.

Bombardment by glucocorticoids also affects the prefrontal cortex (PFC), key to long-term planning, executive function and impulse control. In the PFC, social stress and elevated glucocorticoids weaken connections between neurons, making it harder for them to communicate. Myelination, the process that insulates cables between neurons and thus helps them pass signals faster, is impaired. Total cell volume in the region declines, and chronic inflammation is activated.

What happens when the PFC is impaired in this way? Lousy, impulsive decisions happen. Consider "temporal discounting": when choosing between an immediate reward and a bigger one if you wait, the appeal of waiting goes down as the time you have to wait goes up. The PFC is normally good at combating this shortsightedness. But stress steepens temporal discounting; the more cumulative stress, the less PFC activation in experiments that call for gratification postponement. For people sliding further into inequality, the less active PFC makes it harder for the brain to choose long-term health over immediate pleasure. That neurological effect might explain why people with more total life stress gain more weight and smoke and drink more than those with fewer stressors.

These changes in the PFC happen in children, too. In separate studies, Martha Farah of the University of Pennsylvania and W. Thomas Boyce, professor emeritus at U.C.S.F., observed that lower-SES kindergartners typically have elevated glucocorticoid levels, a thinner and less active PFC, and poor PFC-dependent impulse control and executive function. These effects increase as kids get older. By adolescence, lower SES predicts smaller PFC volume. By adulthood, low SES predicts steeper temporally discounted decisions.

Some of these observations present a tricky chicken-and-egg question. The brain changes could lead to poor choices, which in turn lead to deeper poverty, rather than the other way around. But the research suggests that causes and effects run in the other direction, with SES and inequality first influencing PFC function and then other bad things happening.

For example, kindergartners' SES predicted their PFC function; few five-year-olds plummet into poverty by squandering their paychecks on drink and horses. Further evidence comes from a 2013 study by Jiaying Zhao of the University of British Columbia and her colleagues. They examined Indian farmers whose economic fortunes vary seasonably. As individuals' SES went from being poorest during planting season to wealthiest after harvest, improvements in PFC function followed.

To me, the most important evidence comes from research in which people's sense of their SES was lowered by the design of the experiment. Afterward these individuals did heavier temporal discounting. In one 2012 study, subjects played a game of chance against one another, with differing amounts of starting resources. "Poor" subjects became more likely to borrow against future earnings and less attuned to helpful clues about game strategy.

In another study, subjects who were prompted to imagine scenarios of financial loss (versus neutral or advantageous ones) did steeper temporal discounting in an unrelated task. In still other research, subjects were primed to imagine their financial burdens by contemplating an expensive car repair; cognitive function was unchanged in high-SES subjects but declined in poorer individuals.

Why should a transient sense of lower SES induce cognitive changes typical of lower SES in the real world? One explanation is that it is a rational response because it is hard to think about squirreling away money for old age if you can barely buy groceries. Poverty makes the future a less relevant place.

But there is also a powerful stress-related explanation: long-term planning and impulse control tires out the PFC. Increase subjects' cognitive "load" with taxing PFC-dependent tasks, and they become more likely to cheat on their diet. Or you can—and scientists have done this—increase cognitive load by tempting dieting subjects with snacks, and then they do worse on PFC-dependent tests. How much this represents literal "depletion" of the PFC metabolically versus declining motivation is unclear.

Either way, lower SES creates chronic financial worry that distracts and exhausts. It is hard to ace a psychological task of, say, subtracting a series of numbers or a more important task of reining in your drinking when you are worrying about paying your rent. One finding in the car-repair study supports this interpretation. When subjects contemplated a repair of negligible cost, low- and high-SES subjects performed equally well on cognitive tasks.

Of course, we need to better understand the biological consequences of inequality and learn better ways to heal its health scars. But frankly, right now we know quite a bit. We know enough to prompt moral outrage at the situation. It is outrageous that if children are born into a disadvantaged family, they will be predisposed toward poor health by the time they start to learn the alphabet. It should not require us to measure inflammation or the length of chromosomes to prove this is wrong, but if it does, more power to this science. SA

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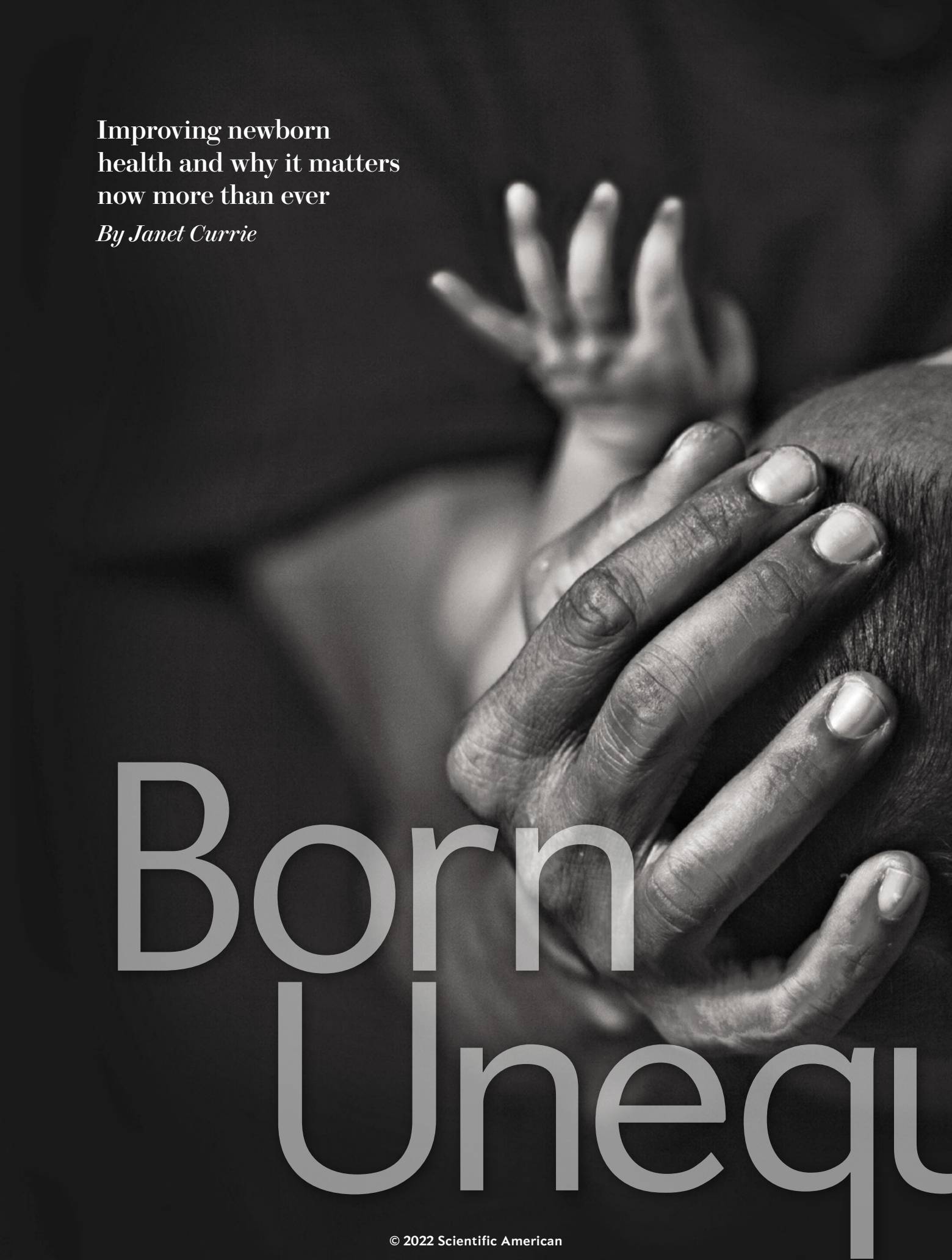

Improving newborn health and why it matters now more than ever

By Janet Currie

Born Unequ

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THE COVID-19 PANDEMIC HAS DISPROPORTIONATELY HURT MEMBERS OF MINORITY COMMUNITIES in the U.S. As of April 2022, 339 Black people out of every 100,000 had died of the coronavirus, compared with 322 of every 100,000 white people. Structural racism accounts for much of this disparity. Black people are more likely to have jobs that require them to leave their homes and to commute by public transport, for example, both of which increase the chances of getting infected. They are also more likely to get grievously ill when the virus strikes. As of March 2022, the hospitalization rate for those who tested positive for SARS-CoV-2 infection was more than two times higher for Black people than for non-Hispanic white people.

One reason for this alarming ratio is that Black people have higher rates of diabetes, hypertension and asthma—ailments linked to worse outcomes after infection with the coronavirus. Decades of research show that these health conditions, usually diagnosed in adulthood, can reflect hardships experienced while in the womb. Children do not start on a level playing field at birth. Risk factors linked to maternal poverty—such as malnutrition, smoking, exposure to pollution, stress or lack of health care during pregnancy—can predispose babies to future disease. And mothers from minority communities were and are more likely to be subjected to these risks.

Today's older Black Americans—those most endangered by COVID—are more likely than not to have been born into poverty. In 1959, 55 percent of Black people in the U.S. had incomes below the poverty level, compared with fewer than 10 percent of white people. Nowadays 20 percent of Black Americans live below the poverty line, whereas the poverty rate for white Americans remains roughly the same. Despite the reduction in income inequality between these groups, ongoing racism works through circuitous routes to worsen the odds for minority infants. For example, partly because of a history of redlining (practices through which financial and other institutions made it difficult for Black families to buy homes in predominantly white areas), even better-off Black people are more likely to live in polluted areas than are poorer white people—with a corresponding impact on fetal health. Worryingly, people disadvantaged in utero are more likely to have lower earnings and educational attainments, so that the effects of poverty and discrimination can span generations.

Researchers now have hard evidence that targeted programs can improve health and reduce inequality. Expansions of public health insurance offered to women, infants and children under Medicaid and the Children's Health Insurance Program have had a tremendous effect, improving the health and well-being of a generation—with the largest impacts on Black children. And interventions after birth can often reverse much of the damage suffered prenatally. Along with other researchers, I have shown that nutrition programs for pregnant women, infants and children; home visits by nurses during pregnancy and after childbirth; high-quality child care; and income support can improve the outcomes for disadvantaged children. Such interventions came too late to help those born in the 1950s or earlier, but they have narrowed the health gaps between poor and rich children, as well as between white and Black children, in the subsequent decades.

Enormous disparities in health and vulnerability remain, however, and raise disturbing questions about how children born to poorer mothers during the current pandemic, with all its social and economic dislocations, will fare. Disturbingly, just before the pandemic hit, many of the most essential programs were being cut back. Between 2018 and 2020, more than a million children lost Medicaid coverage because of new work requirements and other regulations, and many became uninsured. Now that the COVID death toll has exposed stark inequalities in health status and their attendant risks, Americans must act urgently to reverse these setbacks and to strengthen public health systems and the social safety net, with special attention to the care of mothers, infants and children.

THE HUNGER WINTER

DECADES OF CAREFUL OBSERVATION and analysis have gone into uncovering the manifold ways in which the fetal environment affects the future health and prospects of a child, and much remains mysterious. It would be unethical to run experiments to measure the toll on a fetus of, say, malnutrition or pollution. But we can look for so-called natural experiments—the (sometimes horrific) events that cause variations in these factors in ways that mimic an actual experiment.

Mohd Fauzie/Getty Images *(preceding pages)*

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The late epidemiologist David Barker argued in the 1980s that poor nutrition during pregnancy could "program" babies in the womb to develop future ailments such as obesity, heart disease and diabetes. Initial evidence for such ideas came from studies of the Dutch "Hunger Winter." In October 1944 Nazi occupiers cut off food supplies to the Netherlands, and by April 1945 mass starvation had set in. Decades later military, medical and employment records showed that adult men whose mothers were exposed to the famine while pregnant with them were twice as likely to be obese as other men and were more likely to have schizophrenia, diabetes or heart disease.

Anyone born in the Netherlands during the famine is part of a cohort that can be followed over time through a variety of records. Nowadays many researchers, including me, look for natural experiments to delineate such cohorts and thereby tease out the long-term impacts of various harms experienced in utero. We also rely heavily on the most widely available measure of newborn health: birth weight. A baby may have "low" birth weight, defined as less than 2,500 grams (about 5.5 pounds), or "very low" birth weight of less than 1,500 grams (3.3 pounds). The lower the birth weight, the higher the risk of infant death. We have made enormous progress in saving premature babies, but low-birth-weight children are still at much higher risk for complications such as brain bleeds and respiratory problems that can lead to long-term disability.

In recent years computer analysis of large-scale electronic records has made it possible to connect infant health, as measured by birth weight, to long-term outcomes not just for cohorts but also for individuals. Studies of twins or siblings, who have similar genetic and social inheritance, show that those with lower birth weight are more likely to have asthma or attention deficit hyperactivity disorder (ADHD) when they get older. Several studies also show that lower-birth-weight twins or siblings have worse scores on standardized tests. As adults, they are more likely to have lower wages, to reside in lower-income areas or to be on disability-assistance programs. In combination, cohort and sibling studies demonstrate that low birth weight is predictive of several adverse health outcomes later in life, including increased probabilities of asthma, heart disease, diabetes, obesity and some mental health conditions.

Birth weight does not capture all aspects of a child's health: a fetus gains most of its weight in the third trimester, for example, but many studies find that shocks in the first trimester are particularly harmful. I nonetheless use the measure in my studies because it is important and commonly available, having been recorded for tens of millions of babies for decades.

Significantly, low birth weight is much more common among infants born to poor and minority mothers. In 2016 13.5 percent of Black mothers had low-birth-weight babies, compared with 7.0 percent of non-Hispanic white mothers and 7.3 percent of Hispanic mothers. Among those with college educations, 9.6 percent of Black mothers had low-birth-weight babies, compared with 3.7 percent of non-Hispanic white mothers. These inequalities in health at birth reflect large differences in exposure to several factors that affect fetal health.

THE POVERTY CONNECTION

AS ALREADY NOTED, the quality of a mother's nutrition substantially influences the health of her babies. In 1962 geneticist James V. Neel hypothesized that a so-called thrifty gene had programmed humankind's hunter-gatherer ancestors to hold on to every calorie they could get and that in modern times, that tendency, combined with an abundance of high-calorie foods, led to obesity and diabetes. Studies on laboratory animals indicate, however, that the link between starvation and disease is not genetic in origin but epigenetic, altering how certain genes are "expressed" as proteins. Prolonged calorie deprivation in a pregnant mouse, for example, prompts changes in gene expression in her offspring that predispose them to diabetes. What is more, the effect may be transmitted through generations.

Poor nutrition during pregnancy can "program" babies in the womb to develop future ailments.

Outright starvation is now rare in developed countries, but poorer mothers in the U.S. often lack a diet rich in fruits and vegetables, which contain essential micronutrients. Deficiencies in folate intake during pregnancy are linked to neural tube defects in children, for example.

At present, one of the leading causes of low birth weight in the U.S. is smoking during pregnancy. In the 1950s pregnant women were told that smoking was safe for their babies. Roughly half of all new mothers in 1960 reported smoking while pregnant. Today, thanks to public education campaigns, indoor-smoking bans and higher cigarette taxes, only about 6 percent of pregnant women say that they smoke. And 54 percent of women who smoked in the three months before they got pregnant quit for at least the duration of their pregnancy.

Possibly because going to college places women in a milieu where smoking is strongly discouraged, mothers with higher education levels are less likely to smoke. Among mothers with less than a high school education, 11.2 percent smoke, compared with fewer than 1 percent of mothers with a bachelor's degree.

Among the many harmful chemicals in cigarette smoke is carbon monoxide (CO), which restricts the amount of oxygen carried by the blood to the fetus. In

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addition, nicotine affects the development of blood vessels in the uterus and disrupts developing neurotransmitter systems, leading to poorer psychological outcomes. Maternal cigarette smoking during pregnancy has also been associated with epigenetic changes in the fetus, although how these alterations affect an individual in later years remains mysterious. Vaping, which has surged since 2010, delivers high doses of nicotine, and surveys show that it has been tried by almost 40 percent of high school seniors. This rise in popularity is extremely alarming because it could have long-term implications for fetal and infant health.

Yet another significant source of harm for fetuses is pollution. Pregnant women may be exposed to thousands of toxic chemicals in the air, water, soil and sundry products at home and at work. Complicating matters, each pollutant acts in a different way. Particulates in the atmosphere are thought to cause inflammation throughout the body, which has been linked to preterm labor and, consequently, to low birth weight. Lead, ingested through water or air, crosses the placenta to accumulate in the fetus and harm brain development. In 2005 Jessica Wolpaw Reyes of Amherst College showed that the phaseout of leaded gasoline in the U.S. led to a decrease of up to 4 percent in infant mortality and low birth weight.

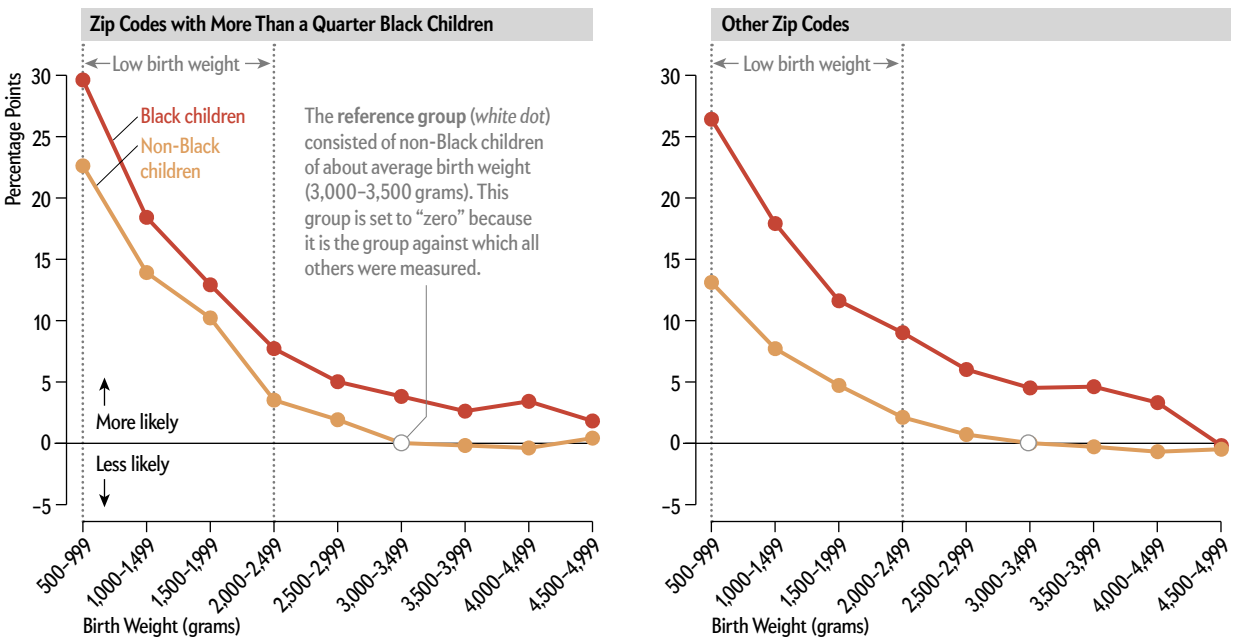
A fetus may also receive less oxygen if its mother inhales CO from vehicle exhaust. In a 2009 study of mothers who lived near pollution monitors, my coworkers and I found that high levels of ambient CO were correlated with reduced birth weight. Worryingly, the effects of CO from air pollution are five times greater for smokers than for nonsmokers.

Reducing pollution can have immediate benefits for pregnant women and newborns. In a 2011 study of babies born in New Jersey and Pennsylvania, Reed Walker of the University of California, Berkeley, and I focused on mothers who lived near E-ZPass electronic toll plazas before and after they began operating. We compared them with mothers who lived a little farther from the toll plazas but along the same busy roads. Both groups of mothers were exposed to traffic, but before E-ZPass, the mothers near the toll plazas were exposed to more pollution because cars idled while waiting to pay the tolls. E-ZPass greatly reduced pollution right around the toll plazas by allowing cars to drive straight

Asthma, Pollution and Residential Segregation

Asthma rates were twice as high for Black people as for other people in the U.S. in 2010. Part of this disparity comes from low birth weight, which is linked to asthma and is more common in Black infants. These graphs illustrate the impact of pollution and residential segregation on asthma rates. They compare New Jersey children in neighborhoods where more than a quarter of children are Black versus children in all other neighborhoods. Comparing the left and right panels shows that low birth weight has a larger effect on asthma rates among children of *all* races in the neighborhoods where most Black children live. Hence, residential segregation, which results in Black children being more likely to live in more polluted places, compounds the negative effects of low birth weight.

Likelihood of Developing Asthma Compared with Non-Black Children of Average Birth Weight



Source: "Is It Who You Are or Where You Live? Residential Segregation and Racial Gaps in Childhood Asthma," by Diane Alexander and Janet Currie, in *Journal of Health Economics*, Vol. 55; July 25, 2017

Graphic by Amanda Montañez

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through. Startlingly, the introduction of E-ZPass reduced the incidence of low birth weight by more than 10 percent in the neighborhoods nearest the toll plazas.

In another study, my collaborators and I examined birth records for 11 million newborns in five states. We found that a shocking 45 percent of mothers lived within about a mile of a site that emitted toxic chemicals such as heavy metals or organic carcinogens—a number that rose to 61 percent among Black mothers. Focusing on babies born to mothers who lived within a mile of a plant, we compared birth weights when the facility was operating with birth weights when it was closed. For additional context, we also compared babies born within a mile of a plant with babies born in a one-to-two-mile band around the plants. Both groups of mothers were likely to be similarly affected by the economics of factory openings and closings, but mothers who lived closer were more likely to have been exposed to pollution during pregnancy. We found that an operating plant increased the probability of low birth weight by 3 percent among babies whose mothers lived less than a mile from the plant.

The racial divide in pollution exposure is profound, in part because of continuing segregation in housing that makes it difficult for Black families to move out of historically Black neighborhoods. Disadvantaged communities may also lack the political power to fend off harmful development, such as a chemical plant, in their vicinity. In the E-ZPass study, roughly half of the mothers who lived next to toll plazas were Hispanic or Black, compared with only about a tenth of mothers who lived more than six miles away from a toll plaza. And in a paper published in 2020, John Voorheis of the U.S. Census Bureau, Walker and I showed that across the entire U.S., neighborhoods with higher numbers of Black residents have systematically worse air quality than other neighborhoods. Black people are also twice as likely as others to live near a Superfund hazardous waste site. For these reasons, pollution-control measures such as the Clean Air Act have greatly benefited Black people.

FIGHT OR FLIGHT

STRESS DISPROPORTIONATELY impacts the poor—who have chronic worries about paying bills, for example—and also harms fetuses. A stressful situation triggers the release of hormones that orchestrate a range of physical changes associated with the fight-or-flight response. Some of these hormones, including cortisol, have been linked to preterm labor, which in turn leads to low birth weight. High circulating levels of cortisol in the mother during pregnancy may damage the fetus's cortisol-regulation system, making it more vulnerable to stress. And stress can trigger behavioral responses in a mother such as increased smoking or drinking, which are also harmful to the fetus.

One revealing study indicates that fetal exposure to maternal stress can have greater negative long-term effects on mental health than stress directly experienced by a child. Petra Persson and Maya Rossin-Slater, both at Stanford University, looked at the impact of the death of a close relative. Death can bring many unwelcome changes to a family, such as reduced income, which may also influence child development. To account for such complications, the researchers used administrative data from Sweden to compare children whose mothers were affected by a death during the prenatal period with those whose mothers were affected by a death during the child's early years. They found that children affected by a death prenatally were

Reducing pollution can have immediate benefits for pregnant women and newborns.

23 percent more likely to use medication for ADHD at ages nine to 11 and 9 percent more likely to use antidepressants in adulthood than were children whose families experienced a death a few years after their birth.

Another pathbreaking study measured levels of cortisol, an indicator of stress, during pregnancy. By age seven, children whose mothers had higher cortisol levels during pregnancy had received up to one year less schooling than their own siblings, indicating that they had been delayed in starting school. Moreover, for any given level of cortisol in the mother's blood, the negative effects were more pronounced for children born to less educated mothers. This finding suggests that although being stressed during pregnancy is damaging to the fetus, mothers with more education are better able to buffer the effects on their children—an important finding in view of the severe stress imposed by COVID on families today.

It is no surprise that disease can also harm a fetus. Douglas V. Almond of Columbia University looked at people born in the U.S. at the peak of the influenza epidemic of 1918 and found that they were 1.5 times more likely to be poor as adults than were those born just before them. In work I conducted with Almond and Mariesa Herrmann of Mathematica looking at mothers born between 1960 and 1990 in the U.S., we found that women who were born in areas where an infectious disease was raging were more likely to have diabetes when they gave birth to their own children decades later—and the effects were twice as large for Black people.

More recently, Hannes Schwandt of Northwestern University examined Danish data and found that maternal infection with ordinary seasonal influenza in the third trimester doubles the rate of premature birth and low birth weight, and infection in the second trimester leads to a 9 percent reduction in earnings and a 35 percent increase in welfare dependence once the child reaches adulthood.

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PREVENTING HARM

HEALTH AT BIRTH and beyond can nonetheless be improved through thoughtful interventions targeting pregnant women, babies and children and through reductions in pollution. The food safety net in the U.S. has already had tremendous success in preventing low birth weight in the babies of disadvantaged women. The rollout of the food stamp program (now called the Supplemental Nutrition Assistance Program, or SNAP) across the U.S. in the mid-1970s reduced the incidence of low birth weight by between 5 and 11 percent. In addition, children who benefited from the rollout grew up to be less likely to have metabolic syndrome—a cluster of conditions that include obesity and diabetes. Notably, women who had benefited as fetuses or young children were more likely to be economically self-sufficient.

The U.S. food safety net has already had immense success in improving children's future prospects.

The 1970s also saw the introduction of the Special Supplemental Nutrition Program for Women, Infants and Children, popularly known as WIC. Approximately half of eligible pregnant women in the U.S. receive nutritious food from WIC, along with nutrition counseling and improved access to medical care. Dozens of studies have shown that when women participate in WIC during pregnancy, their babies are less likely to have low birth weight. In work looking at mothers in South Carolina, Anna Chorniy of Northwestern, Lyudmyla Ardan (Sonchak) of Susquehanna University and I were able to show that children whose mothers received WIC during pregnancy were also less likely to have ADHD and other mental health conditions that are commonly diagnosed in early childhood.

In the late 1980s and early 1990s, state and federal governments worked together to greatly expand public health insurance for pregnant women under the Medicaid program. In work with Jonathan Gruber of the Massachusetts Institute of Technology, I showed that public health insurance lowered infant mortality and improved birth weight. Today the children whose mothers became eligible for health insurance coverage of their pregnancies in that period have higher levels of college attendance, employment and earnings than the children of mothers who did not. They also have lower rates of chronic conditions and are less likely to have been hospitalized. The estimated effects are strongest for Black people, who, having lower average incomes, benefited the most from the expansions. The fact that these babies are more likely to eventually get a college education also increases the life chances of *their* children. In the U.S., an additional year of college education for the mother reduces the incidence of low birth weight in her children by 10 percent.

Even so, too many children are still born with low birth weight, especially if their mothers are Black. Significantly, targeted interventions after birth can improve their outcomes. Programs such as the Nurse-Family Partnership provide home visits by nurses to low-income women who are pregnant for the first time, many of whom are young and unmarried. The nurse visits every month during the pregnancy and for the first two years of the child's life to provide guidance about healthy behavior. The assistance reduces child abuse and adolescent crime and enhances children's academic achievement.

Providing cash payments to poor families with young children also improves both maternal health and child outcomes, suggesting that COVID relief payments will have important protective effects. In the U.S., the largest preexisting program of this type is the Earned Income Tax Credit (EITC). Studies of beneficiaries of the EITC show that children in families that received increased amounts had higher test scores in school. With financial stress being somewhat relieved, the mental health of mothers in these families also improved. In addition, quality early-childhood education programs augment future health, education and earnings and reduce crime. Head Start, the federally funded preschool program that was rolled out beginning in the 1960s, has also had substantial positive effects on health and education outcomes, especially in places with less access to alternative child care centers.

A 2018 study, especially noteworthy in light of the tragic lead poisoning in Flint, Mich., shows that even some of the negative effects of lead can be reversed. In Charlotte, N.C., lead-poisoned children who received lead remediation, nutritional and medical assessments, WIC and special training for their caregivers saw reductions in problem behaviors and advanced school performance.

LOOKING AHEAD

INVESTMENTS IN PREGNANT WOMEN and infants have been paying off, their success reflected in dramatically falling infant mortality rates in the U.S.—despite rising inequality in income and wealth. Alarmingly, however, many successful programs, such as the Clean Air Act, SNAP and Medicaid, are under attack. The Coronavirus Aid, Relief and Economic Security (CARES) Act passed in March 2020 provided some relief, at least with respect to Medicaid. CARES temporarily suspended disenrollment from the program, giving additional flexibility to state Medicaid programs in terms of time lines and eligibility procedures. Still, states may be hard-pressed to enroll the many who will become newly eligible for Medicaid because of job loss. Moreover, states that have not expanded the Medicaid program to cover otherwise ineligible low-income adults, as allowed by the Affordable Care Act, may see many more uninsured.

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SKYLINE of Flint, Mich., in 2016, after declaration of a federal emergency because of lead contamination in the water supply.

Brett Carlsen/Getty Images

A National Academies of Sciences, Engineering and Medicine report published in 2019 laid out a road map for reducing child poverty by half within 10 years. One of the most stunning findings of the report is that it is feasible to meet that target by expanding programs that already exist. Following these directions would have a profound impact on health and health disparities. Targeted approaches, such as more thorough investigation of maternal deaths occurring up to one year after a birth, are also necessary. Even simple preventive measures such as giving pregnant women flu shots can have a tremendously positive effect on infant health and child development. Diagnosis and treatment of conditions such as preeclampsia (high blood pressure associated with pregnancy) are key to both protecting babies and lowering maternal mortality rates. It is important to help pregnant women quit smoking and to develop new approaches relevant to a new generation addicted to vaping. Also needed are stronger protections for women at risk of domestic violence, which leads directly to chronic stress, premature deliveries and low birth weight.

One salient open question is what effect the pandemic will have on the generation of children affected by it in utero and in early life. COVID itself may have negative effects on the developing fetus. The latest data suggest that although the overall risk is low, pregnant women are at increased risk of becoming critically ill (as they are with influenza or SARS). Affected babies, however, do not seem to be at risk of obvious birth defects (as they are with the Zika virus). Still, given the fact that COVID affects many body systems, it may prove to have subtler negative effects on the developing fetus. The pandemic is also an extremely stressful event compounded by the sharpest economic downturn since the Great Depression. The years 2020 and 2021 saw marked increases in domestic violence, alcohol consumption and drug overdoses, all of which are known to be harmful to the developing fetus. In consequence, the generation being born now is likely to be at increased risk going forward and will require intensive social investments to overcome its poorer start in life.

In a July 2020 sermon on the late civil rights leader John Robert Lewis, Reverend James Lawson recounted the significant gains for Americans of all colors that had resulted from that movement. He went on to ask that America's political leaders "work unfalteringly on behalf of every boy and every girl, so that every baby born on these shores will have access to the tree of life ... let all the people of the U.S.A. determine that we will not be quiet as long as any child dies in the first year of life in the United States. We will not be quiet as long as the largest poverty group in our nation are women and children." As we rebuild our shattered safety nets and public health systems in the aftermath of COVID, we need to seize the moment and use the knowledge we have gained about how to protect mothers and babies—to give every child the opportunity to flourish. SA

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How to Reduce Maternal Mortality

To prevent women from dying in childbirth, the first step is to stop blaming them

TEXT BY MONICA R. McLEMORE AND GRAPHICS BY VALENTINA D'EFILIPPO

The shameful secret is out: Although the number of women who die in childbirth globally has fallen in recent decades, the rates in the U.S. have gone up. Since 1987 maternal mortality has doubled in the U.S. Now approximately 800 maternal deaths occur every year. One of the most striking takeaways from examining the data is racial disparity: Black women are three to four times more likely to die from pregnancy-related conditions such as cardiac issues and hemorrhage and to bear the brunt of serious complications. That risk is equally shared by all Black women regardless of income, education or geographical location. In other words, the factors that typically protect people during pregnancy are not protective for Black women.

Fortunately, most of these deaths are considered preventable, and therefore much more can be done to stop them. First, everyone—from doctors to the media to the public—needs to stop blaming women for their own deaths. Instead we should focus on better understanding the underlying contributing factors. These include a lack of data; not educating patients about signs and symptoms—and not believing them when they speak up; errors made by health-care providers; and poor communication among different health-care teams. Finally, studies have shown that interventions such as wider access to midwifery, group prenatal care, and social and doula support are effective in improving maternal health outcomes.

Progress has been slow and uneven. Deaths from hemorrhage, for example, have been reduced by half in some states because of standardized tool kits for care. And California has led in the pursuit of understanding root causes of maternal mortality. Still, structural racism is proving to be an intractable force.

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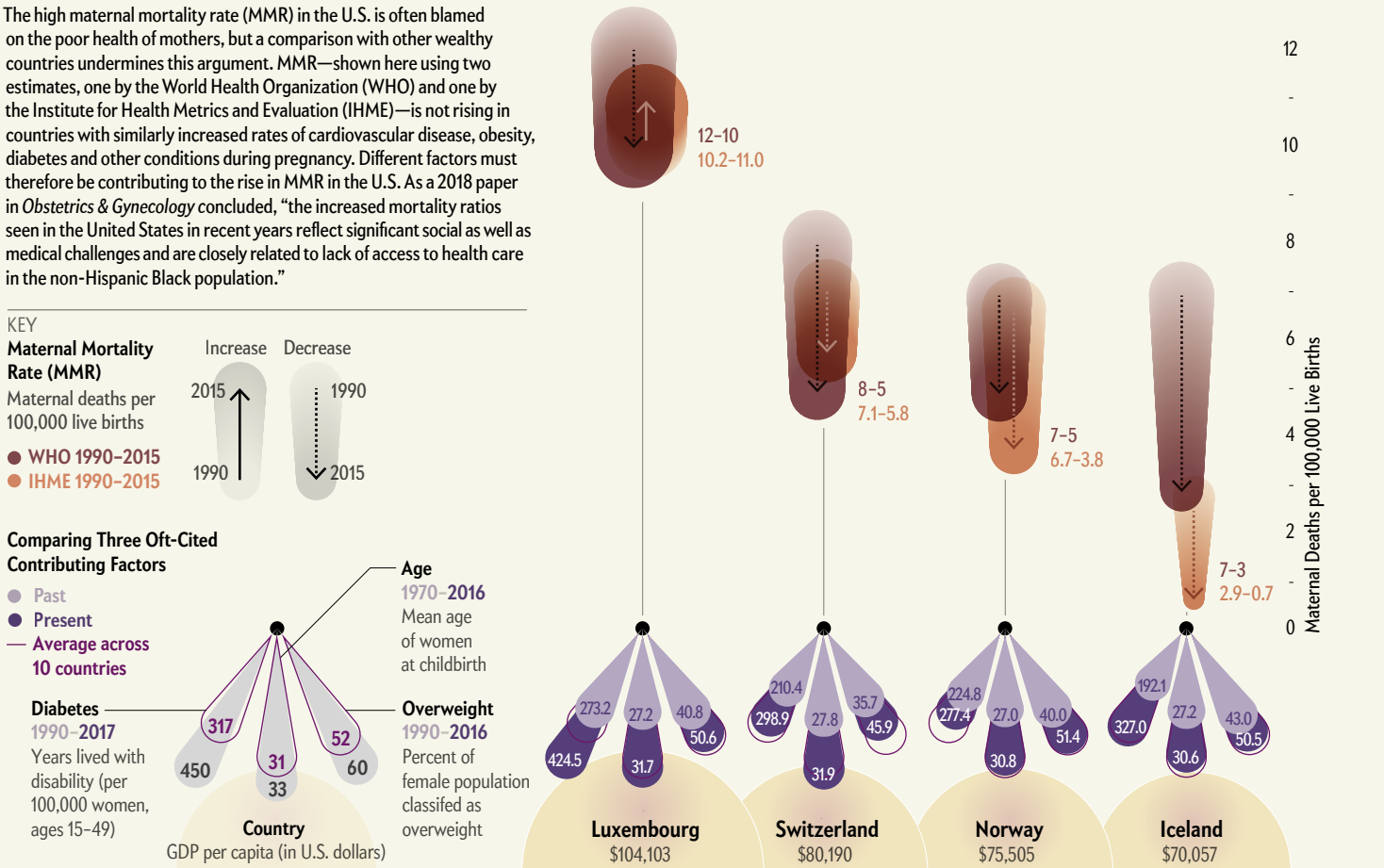
Valentina D'Efilippo is an award-winning designer, creative director, and co-author of *The Infographic History of the World*. A voice in the field of data design, she leads a series of Masterclasses with the *Guardian*.

The U.S. Is an Outlier

The high maternal mortality rate (MMR) in the U.S. is often blamed on the poor health of mothers, but a comparison with other wealthy countries undermines this argument. MMR—shown here using two estimates, one by the World Health Organization (WHO) and one by the Institute for Health Metrics and Evaluation (IHME)—is not rising in countries with similarly increased rates of cardiovascular disease, obesity, diabetes and other conditions during pregnancy. Different factors must therefore be contributing to the rise in MMR in the U.S. As a 2018 paper in *Obstetrics & Gynecology* concluded, "the increased mortality ratios seen in the United States in recent years reflect significant social as well as medical challenges and are closely related to lack of access to health care in the non-Hispanic Black population."



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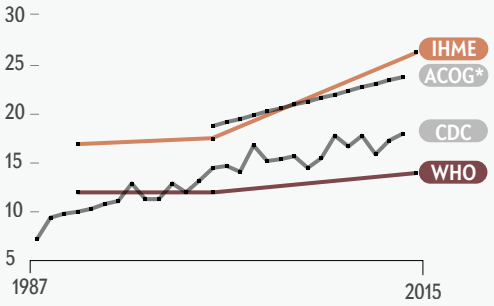
U.S. Maternal Mortality Rate Estimates

According to different organizations



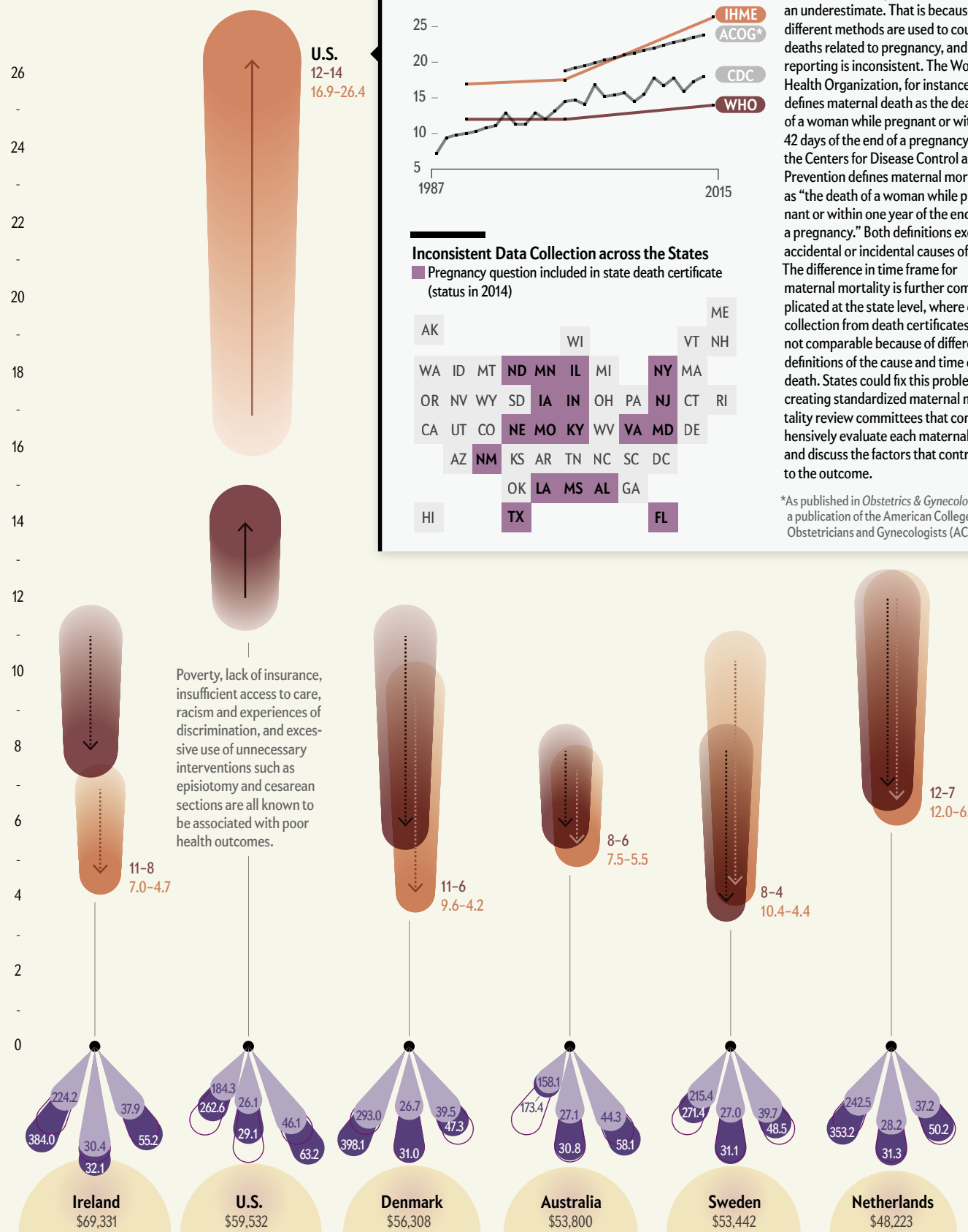
Inconsistent Data Collection across the States

Pregnancy question included in state death certificate (status in 2014)

Maternal Mortality Data in the U.S. Are an Unreliable Mess

As bad as the numbers sound, the U.S. MMR is widely considered to be an underestimate. That is because different methods are used to count deaths related to pregnancy, and reporting is inconsistent. The World Health Organization, for instance, defines maternal death as the death of a woman while pregnant or within 42 days of the end of a pregnancy. But the Centers for Disease Control and Prevention defines maternal mortality as "the death of a woman while pregnant or within one year of the end of a pregnancy." Both definitions exclude accidental or incidental causes of death. The difference in time frame for maternal mortality is further complicated at the state level, where data collection from death certificates is not comparable because of different definitions of the cause and time of death. States could fix this problem by creating standardized maternal mortality review committees that comprehensively evaluate each maternal death and discuss the factors that contributed to the outcome.

*As published in *Obstetrics & Gynecology*, a publication of the American College of Obstetricians and Gynecologists (ACOG).



Sources: Global Health Observatory data repository, World Health Organization (*WHO MMR data*); Maternal Mortality 1990–2015 tables in *Global Burden of Disease Study 2015*. Global Burden of Disease Collaborative Network. Institute for Health Metrics and Evaluation, 2016 (*IHME MMR data*); IHME (*diabetes*); Organisation for Economic Co-operation and Development (*age*); WHO (*weight*); World Bank (*GDP*); "Recent Increases in the U.S. Maternal Mortality Rate: Disentangling Trends from Measurement Issues," by Marian MacDorman et al., in *Obstetrics & Gynecoiogy*, Vol. 128, No. 3; September 2016 (*ACOG data* and *map*)

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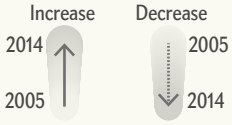
Who Is Dying?

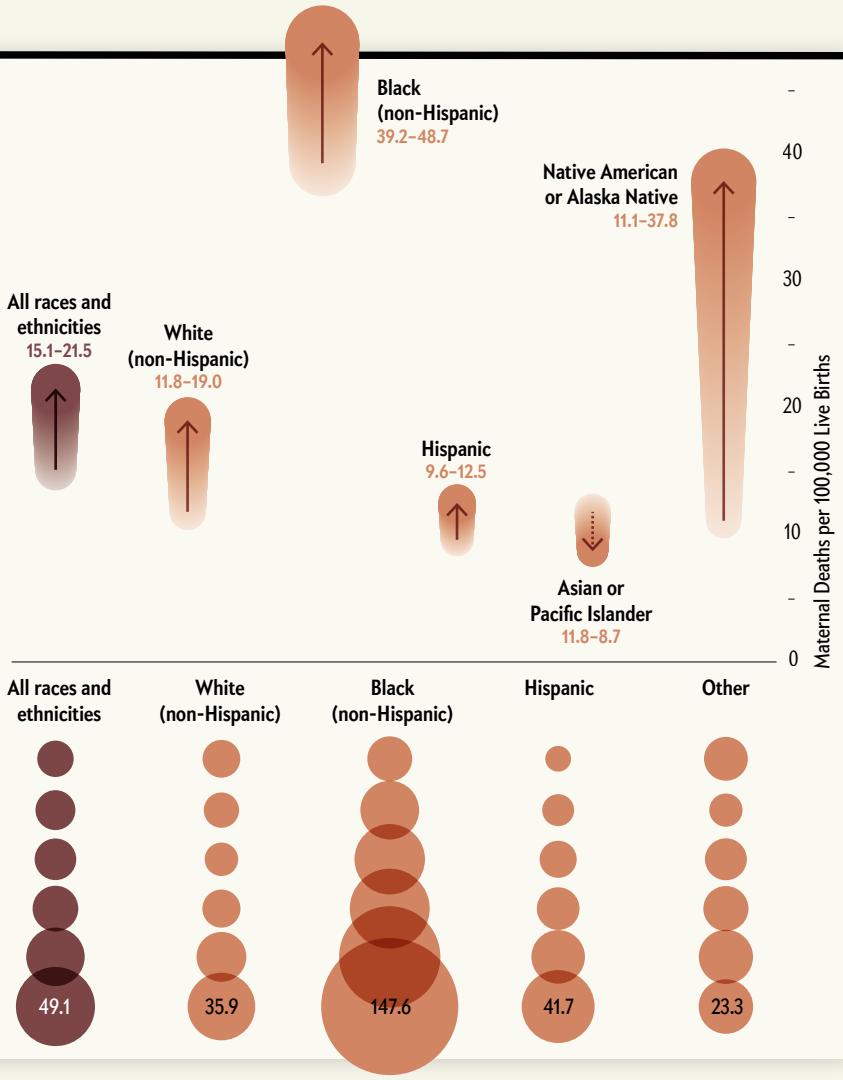
It's common to blame women for their own deaths. Many scientific publications have cited that women are coming to pregnancy older (called advanced maternal age, or geriatric pregnancy), sicker (with hypertension, diabetes or other chronic illnesses) and fatter (that is, with obesity). But even in studies that control for age, chronic disease and obesity, the MMR in the U.S. still far exceeds rates in similarly wealthy nations. In a 2016 report that looked at pregnancy-related death disparities among states, the authors wrote that "excellent care is apparently available but is not reaching all the people."

U.S. Maternal Mortality Rate over Time, by Race and Ethnicity

2005–2014

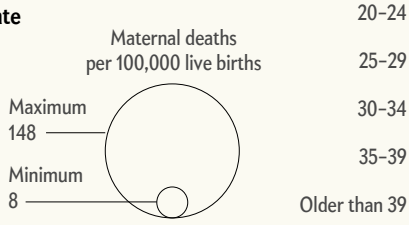


In all racial categories, maternal mortality is worse among older women, but the burden is concentrated among Black women, who are more likely to experience structural determinants of health that worsen over time.



U.S. Maternal Mortality Rate across Age Groups

2006–2010

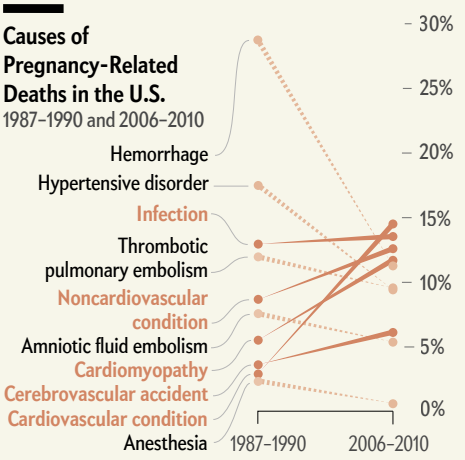


Why Are Mothers Dying—And How Many Causes Are Preventable?

Pregnancy exacerbates existing clinical conditions such as cardiovascular disease (including high blood pressure), enlarged heart and an irregular heartbeat. Black women are more likely to have these conditions before, during and after pregnancy. Chronic toxic stress—the way that experiences of discrimination are embodied—has been shown to make these conditions worse. But in the U.K., for example, there were only two deaths from preeclampsia and eclampsia over a three-year period, according to a 2018 study, suggesting deaths from these hypertensive disorders of pregnancy are highly preventable. Life-threatening heavy bleeding, or hemorrhage, is also one of the major risk factors for death and is easily preventable. One way this can be done is to develop checklists that document bleeding over time and interventions to address it; these checklists must be accessible to all members of a health-care team.

Causes of Pregnancy-Related Deaths in the U.S.

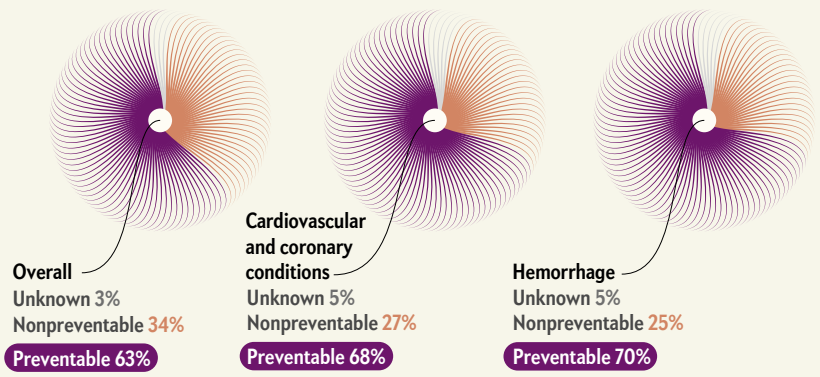
1987–1990 and 2006–2010



There have been significant reductions in pregnancy-related deaths from hypertensive disorders and hemorrhage. MMR rates are dynamic and shift over time.

Distribution of Preventability among Pregnancy-Related Deaths

Per a 2018 report including data from nine states, spanning 2008–2017



About a third of all maternal deaths are considered to be nonpreventable. But the most common conditions associated with maternal mortality, such as heart disease and hemorrhage, can be better handled to avoid poor outcomes.

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How the U.S. Is Tackling the Problem—Or Not

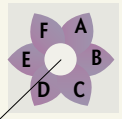
Several groups, including the World Health Organization, have called for a more respectful approach to maternal care. This would be helped by diversification of the health-care workforce so that clinical teams reflect the populations they serve. It also means better communication of knowledge between patients and their health-care teams. One program that embraces these features is called the Alliance for Innovation on Maternal Health (AIM). Funded through the federal Maternal and Child Health Bureau, AIM is a national alliance to promote consistent and safe maternity care. It launched with the initial goal of reducing maternal mortality by 1,000 instances—and severe maternal morbidity by 100,000 instances—between 2014 and 2018. Many states are currently participating. The efforts involved in AIM include hospital-based interventions whereby health-care teams—from obstetricians to emergency room staff—practice simulations of emergencies. The alliance also advocates for increased access to doulas and midwives, as well as a reclamation of normal physiological birth—that is, not treating birth as a disease to be managed.

Which States Are Taking Action?

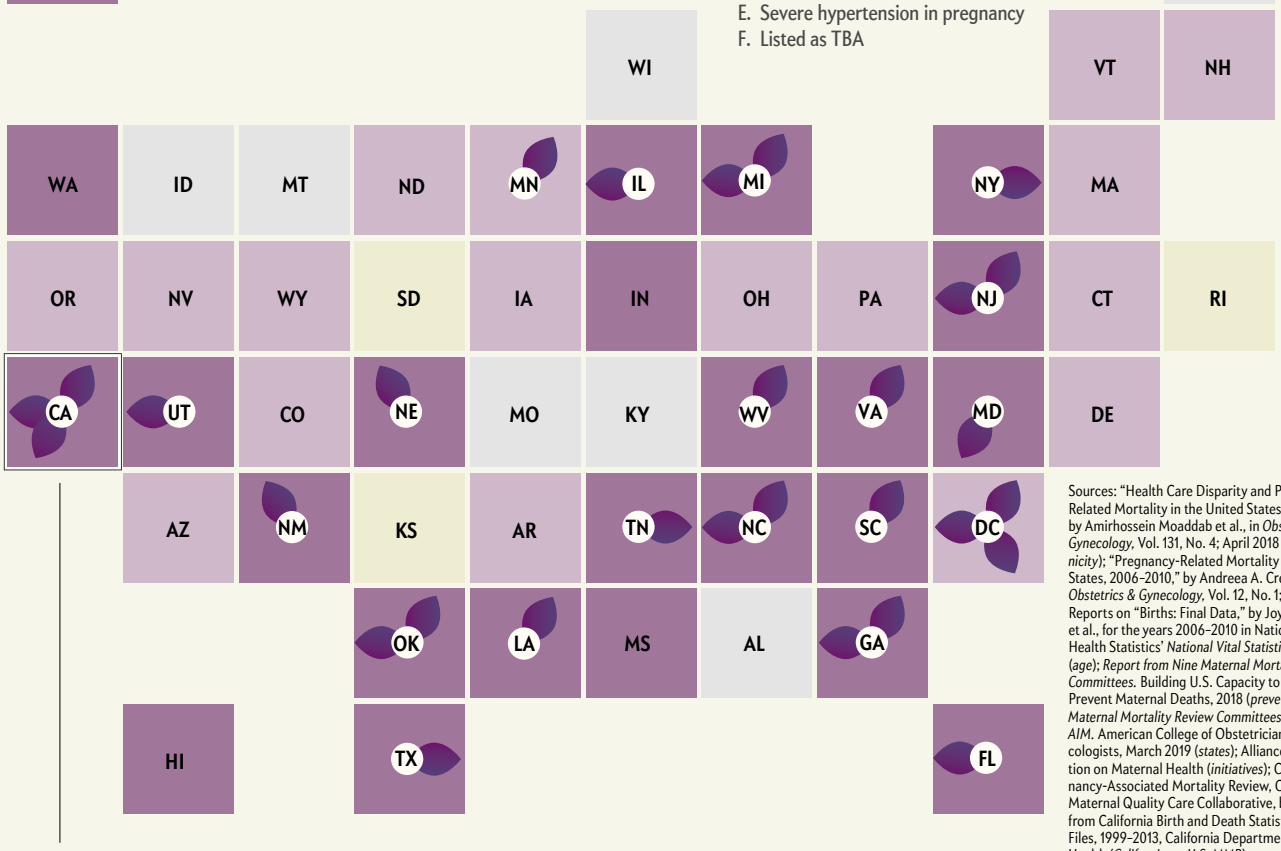
Alliance for Innovation on Maternal Health

KEY

AIM states (as of March 2019)
- AIM states
- States with intent to apply
- States exploring engagement
- No data



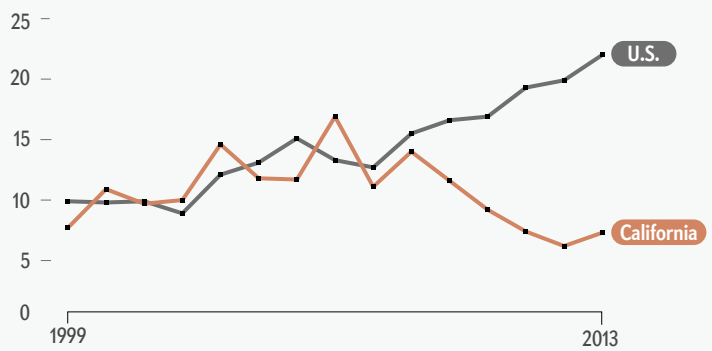
AIM initiatives
- A. Obstetric hemorrhage
- B. Obstetric care for women with opioid use disorder
- C. Reduction of peripartum racial/ethnic disparities
- D. Safe reduction of primary cesarean birth
- E. Severe hypertension in pregnancy
- F. Listed as TBA



Sources: "Health Care Disparity and Pregnancy-Related Mortality in the United States, 2005–2014," by Amirhossein Moaddab et al., in *Obstetrics & Gynecology*, Vol. 131, No. 4; April 2018 (*race and ethnicity*); "Pregnancy-Related Mortality in the United States, 2006–2010," by Andreea A. Creanga et al., in *Obstetrics & Gynecology*, Vol. 12, No. 1; January 2015; Reports on "Births: Final Data," by Joyce A. Martin et al., for the years 2006–2010 in National Center for Health Statistics' *National Vital Statistics Reports* (*age*); *Report from Nine Maternal Mortality Review Committees*. Building U.S. Capacity to Review and Prevent Maternal Deaths, 2018 (*preventability*); *State Maternal Mortality Review Committees, PQCs, and AIM*. American College of Obstetricians and Gynecologists, March 2019 (*states*); Alliance for Innovation on Maternal Health (*initiatives*); California Pregnancy-Associated Mortality Review, California Maternal Quality Care Collaborative, based on data from California Birth and Death Statistical Master Files, 1999–2013, California Department of Public Health (*California vs. U.S. MMR*)

California vs. U.S. Maternal Mortality Rate

Maternal deaths per 100,000 live births (1999–2013)



California Leads the Way

Established in 2006, the California Maternal Quality Care Collaborative (CMQCC) set out to use data-driven approaches to understand the root causes of maternal mortality. A few of their tactics included distributing plain-language tool kits, conducting mock emergencies, making quality improvements in hospital settings and training staff to work more collaboratively. Despite admirable reductions in overall maternal mortality in California, significant racial disparities remain and align with the demographics represented in the national data sets. Keeping Black women alive before, during and after birth was the focus of an innovative hospital-based racial equity pilot program: the SACRED Birth study, launched in 2020 by University of California, San Francisco, associate professor of obstetrics Karen A. Scott. This community-centered study co-led by Black women and community-based organizations provides essential insights on achieving birth equity and justice. Data collection ended at the beginning of 2021.

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Not Just for Men

Researchers and doctors must dig deeper into gender differences before they can provide women with better treatments

By Marcia L. Stefanick

IN JANUARY 2013 THE U.S. FOOD AND DRUG ADMINISTRATION CUT THE RECOMMENDED dose of the nation's most popular sleep drug, Ambien, in half for women but not for men. The FDA had determined that 15 percent of the 5.7 million women using zolpidem products (the active ingredient in Ambien) were experiencing driving impairment eight hours after taking the drug, compared with 3 percent of the 3.5 million male zolpidem users.

Researchers had known for a long time that women, on average, clear zolpidem from their body much more slowly than men do. Indeed, drug metabolism, tolerance, side effects and benefits differ significantly between the average man and woman for many widely prescribed medications, with women having a 50 to 70 percent higher chance of an adverse reaction. Body size, proportion of fat to muscle and a host of other factors, including hormonal influences, account for these differences. But physicians rarely consider these dynamics when writing prescriptions. Ambien, which now comes in bottles with pink (low dose) and blue (original dose) labels, is a rare example of a "sex-specific" medical recommendation. (The FDA now recommends that men also be started on the low dose of the drug, and doctors can use their discretion to increase the dose.)

Drug-dosing problems are just one example of how the health-care system is blind to biological sex differences. As a result, women are too often treated like men. Moreover, the system can be blind to gender bias; some disorders are considered "men's" or "women's," even when both sexes suffer from them. Doctors often fail to diagnose stereotypical "male" conditions in women, and vice versa, until the condition has become dangerous.

Illustration by Anna Parini

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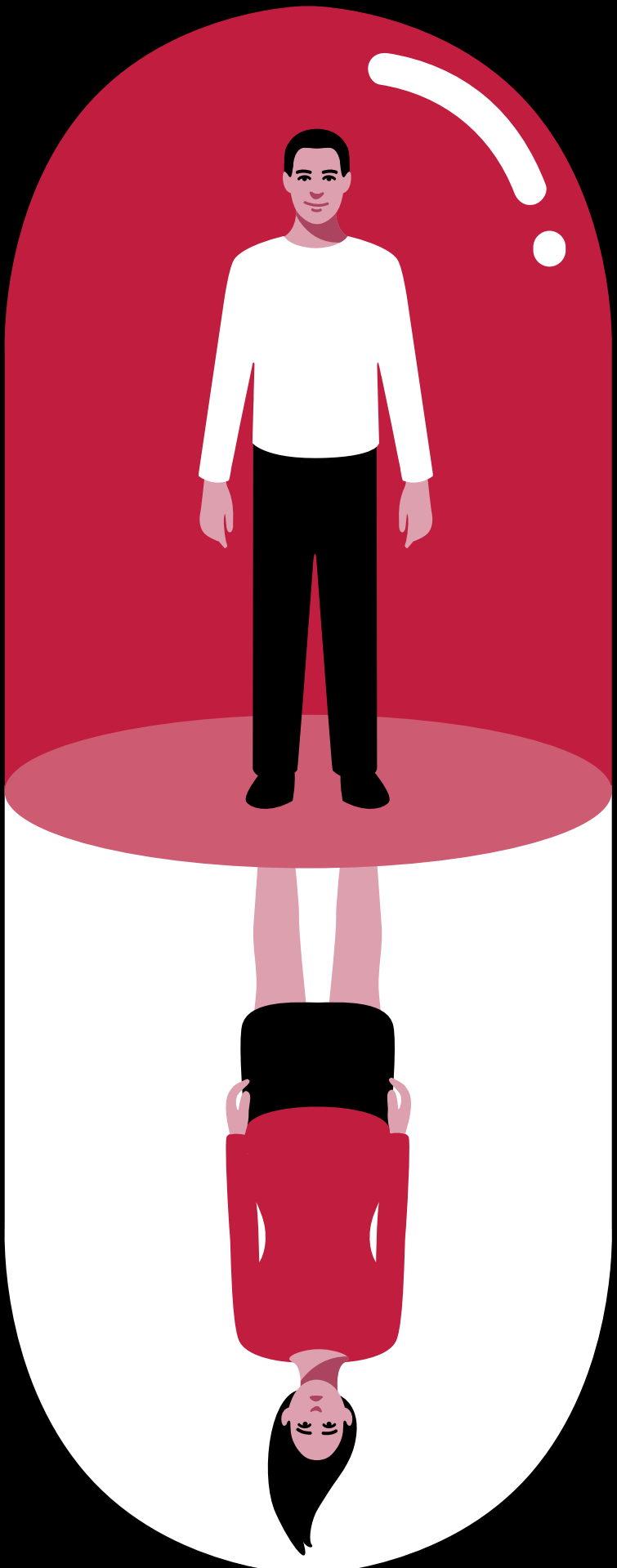

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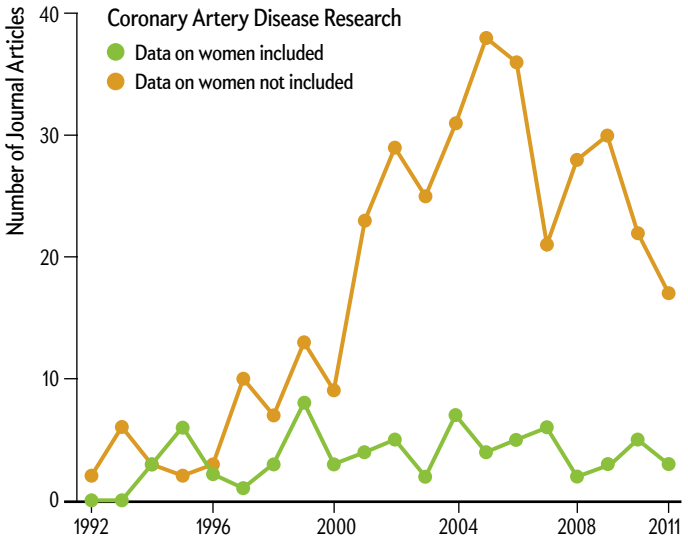
Research Bias

Medical studies often involve only male subjects or do not break out statistics for women if they are included. For example, a 2012 analysis of coronary artery disease therapies found that 355 of 427 journal articles (83 percent) either included no data for women or did not analyze data for women versus men. The paucity of research makes it difficult for doctors to assess treatments that could help women.



These problems arise from a serious gap in our understanding of sex differences. The vast majority of animal research has been conducted only on males, mostly on rodents. And women have been grossly underrepresented in human clinical trials. Even when both sexes are included, sex-specific analyses are generally not reported—and because most subjects are men, the findings may not pertain to women. A 2019 study found that only 7 percent of reports on adverse drug reactions in people with heart failure gave data separately for women and men. And nearly half of these showed significant differences between the two. Not surprisingly, no one understood why a young woman hospitalized with a heart attack was twice as likely to die as a young man. Failure to include women in biomedical research was exacerbated by 1977 FDA guidelines that barred women of childbearing potential from participating in phase I (safety) and phase II (efficacy) trials, whether they were planning a pregnancy or not. Although the FDA now allows for inclusion of pregnant women in research that does not threaten pregnancy, few drugs are approved for pregnant women because safety and effectiveness data are not available.

FIXING THE PROBLEM

CHANGES IN PRACTICES have been long in coming. In 1990 scientists, advocates and members of Congress pushed the National Institutes of Health to establish the Office of Research on Women's Health. In 1991 cardiologist Bernadine Healy, the first and only woman director of the NIH, launched the Women's Health Initiative, which enrolled nearly 162,000 women across the U.S. The study led to important changes in clinical care; without it, for example, physicians might still believe they should put most older women on hormone therapy, leading to many more heart attacks and strokes and cases of breast cancer. The 1993 NIH Revitalization Act required enrollment of female (and minority) participants in federally supported phase III trials—those designed to determine how a new treatment works in a large group. The act did not, however, require enrollment of enough women to determine how a given treatment affected women specifically.

More change came in 2001, when a landmark Institute of Medicine (IOM) report emphasized the important role that "sex" played in the basic biology that underpins health care. It concluded that "every cell has a sex." Yet almost no cell biologists consider, or even know, the sex of the cells or tissues they study. Nor do they address how sex chromosomes affect the systems they are investigating. The IOM report defined sex as a biological quality or classification of sexually reproducing organisms, generally male or female, derived from chromosomes and sex hormones. Gender was defined, in human studies, as sociocultural—a person's "self-representation as male or female."

This concept can be expanded to include gender norms (social expectations of "masculine" and "feminine" behaviors) and gender relations (how people react to one another because of gender), all of which can exert powerful influences on biology. For example, men are generally stronger than women not only because of biological factors such as larger muscles but also because of gender roles: in many societies, men lift and carry most of the heavy objects. Another example might be the twofold greater incidence of (unipolar) depression in women, which may result from an interaction of biological and social factors, such as women being more likely to be sexually assaulted.

Since the IOM report, scientists, academicians and health policy advocates have been urging their institutions, journals and government agencies to confront the need to include women and female animals in research and to study sex differences. In 2009 the Gendered Innovations project at Stanford University engaged collaborators across the U.S., Canada and the European Union to develop practical methods for sex and gender analysis and to track progress on including sex and gender in research. In 2010 the Office of Research on Women's Health issued a strategic plan that identified the need to integrate sex and gender perspectives in basic science and medical research.

That same year the Canadian Institutes of Health Research went further and began asking grant applicants to indicate whether sex or gender was accounted for in their study proposals. A May 2014 notice in the

Source: "Treatment Strategies for Women with Coronary Artery Disease: Future Research Needs: Identification of Future Research Needs from Comparative Effectiveness Review No. 66," by Rowena J. Dolor et al. Agency for Healthcare Research and Quality, Report No. 13-Ehc073-ef; February 2013

Graphic by Jen Christiansen

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journal *Nature,* written by Francis Collins, who was then director of the NIH, and Janine Clayton, director of the Office of Research on Women's Health, unveiled policies designed to ensure that NIH-funded preclinical research consider both females and males, as well as the sex of cells. And in January 2016 the NIH began to require that sex as a biological variable be factored into research designs, analyses and reporting. If grant applicants propose to study only one sex, they must present persuasive justification for doing so. In contrast to the Canadian Institutes, however, the NIH did not address the influence of gender on biology.

A MAN'S DISEASE

GENDER BIASES profoundly influence diagnoses and treatments and therefore health outcomes. Despite years of "Red Dress" campaigns, most people and many physicians still think of heart disease as a man's disease. They are surprised to learn that heart disease is the number-one killer of U.S. women, far exceeding deaths from breast cancer. Younger women, in particular, often go undiagnosed because physicians do not consider the possibility. Furthermore, women commonly report a range of symptoms beyond chest pain—the key complaint of men—including back pain, nausea, headache, dizziness and pain down the right arm (not just the left). Physicians often refer to these common symptoms as "atypical" because men do not report them.

In addition, although men and older women are likely to have a blockage in one or more of the coronary arteries from localized plaque—a buildup of cholesterol, fat and other substances—younger women are more likely to have diffuse plaque that lines and narrows the entire artery, resulting in inadequate blood supply to the heart. Because no specific blockage is detected, they may be diagnosed as "free of heart disease" yet at high risk of a fatal heart attack. Although newer diagnostic tests can detect this nonobstructive disease, a physician has to consider the possibility that a young woman has heart disease to order them. Prevention and treatment guidelines for women are still based predominantly on male data, despite growing evidence of sex differences in risks and treatment outcomes.

Pregnancy, now recognized as a major cardiovascular stress test, also contributes to sex disparities, yet researchers have only recently begun to realize the serious long-term consequences. Pregnancy-related hypertension and preeclampsia, as well as gestational diabetes (high blood glucose developed during pregnancy), increase a woman's chance of developing subsequent cardiovascular disease nearly twofold, as well as her risk of developing type II diabetes.

HARD TO DECIPHER

SEX DIFFERENCES and gender biases influence medical diagnoses and treatments for *everyone*. Osteoporosis, characterized by reduced bone strength, is considered a woman's disease because white women have twice the lifetime risk of fracturing a bone, compared with white men. Fracture-prevention trials have included few men. Yet men account for nearly one in three hip fractures, and their medical outcomes are worse after the injury.

Men are more susceptible to viral, bacterial, parasitic and fungal infections than women are, although women have greater rates of sexually transmitted infections such as HIV and herpes simplex virus 2. On the other hand, the more robust immune system of women may explain why they constitute more than 70 percent of the 24 million Americans with autoimmune diseases, in which the immune system attacks one's own body tissues. Pregnancy may play a role here as well. Some fetal cells cross into the mother's blood and are found in her circulation decades later, and they have been implicated in some autoimmune diseases.

Sex and gender also shape neurological and mental diseases. Accumulating evidence suggests that the placenta of the male fetus responds to environmental stressors by promoting fetal growth, whereas the female placenta promotes gene and protein expression that increases chances of survival. This difference may contribute to developmental disorders that are diagnosed more often in boys, such as autism and dyslexia—although diagnostic methods may overlook girls.

Gender bias surrounding mental illnesses seems to be widespread. The suggestion that boys and men manifest depression with anger, rather than withdrawal, may arise from a biased expectation that males externalize behaviors and females internalize them. Some mental health professionals around the world still assign certain symptoms almost exclusively to women, such as being "hysterical," whereas men are likely to be diagnosed as "antisocial." These biases affect treatments and health outcomes. In addition, a woman is much more likely to be diagnosed with depression than a man with identical presentation because of gender biases in the medical system. Women also receive more antidepressants and less adequate pain medication when reporting pain because of an incorrect belief that they have a greater tolerance to it. In fact, they have a lower threshold for almost every kind of pain investigated.

Bias is rampant when it comes to the brain. Pop psychology loves the idea that men and women have different brains. Reports show that males have more cortical connections within each of the brain's two hemispheres, whereas women have more connections between the hemispheres. But the reports fail to mention that 86 to 88 percent of all these combined connections are similar—suggesting that male and female brains are more alike than different. Research also increasingly shows that any individual's brain development over a person's lifetime is greatly influenced by neuroplasticity—the ability of brain cells to rewire over time. If the daily experiences of boys and men differ markedly from those of girls and women, differences in brain structure and function should be expected.

This complicated picture makes it difficult to pin down causes and treatments for brain illnesses. Almost

LOPSIDED SCIENCE

5.5 to 1

The ratio of neuroscience studies that incorporate only male animals compared with ones that use just females. Animal research provides the underpinning for many psychoactive drugs.

Source: "Sex Bias in Neuroscience and Biomedical Research," by Annaliese K. Beery and Irving Zucker, in *Neuroscience and Biobehavioral Reviews,* Vol. 35, No. 3; January 2011

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Note to Doctor: Women Are Not Men

Medical studies relied heavily on men or male animals in the past, which slowed progress in women's health care, according to the Institute of Medicine. Although researchers are finally improving the mix, women and female animals are still in the minority. Parity is needed because many illnesses affect women differently than men. Women often respond differently to treatments as well. Here is just a sample.

CANCER

Overall, cancer kills more men than women, but averages mask important sex differences in specific types of cancer. Recognizing disparities could prevent doctors from overlooking or misdiagnosing symptoms.

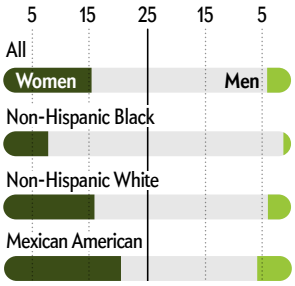
Women have a higher risk than men of developing right-sided colon cancer, a more aggressive killer than left-sided colon cancer. Diagnosis in women also tends to be more delayed.

More men than women die from lung, colon, kidney and liver cancer. But overall cancer risk is higher for women under age 50.

Being taller is a risk factor for many cancers in both men and women and may account for one third of the greater total cancer risk in men.

Side effects from fluorouracil, a common chemotherapy drug, are significantly worse in women; so are effects from many other cancer drugs.

Prevalence of Osteoporosis (percent of U.S. residents aged 50 and up, 2010)



BONES AND JOINTS

Sex and gender differences work both ways. White women are twice as likely as white men to have osteoporosis—fragile bones—but the risk of death from fragile-bone fractures is 50 percent greater for men.

Women undergo about two thirds of all knee replacements, but there is no evidence that "gender-specific" knees, marketed by manufacturers, improve outcomes. Overemphasizing sex differences can be a problem.

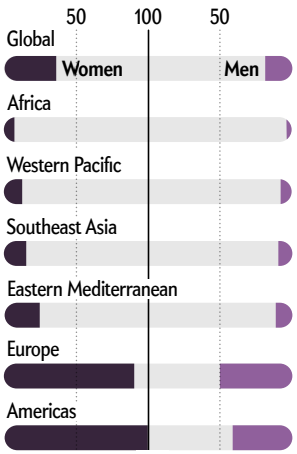
DISEASE

Certain thyroid autoimmune illnesses such as Hashimoto's disease and Graves' disease are 7 to 10 times higher in women; so is lupus.

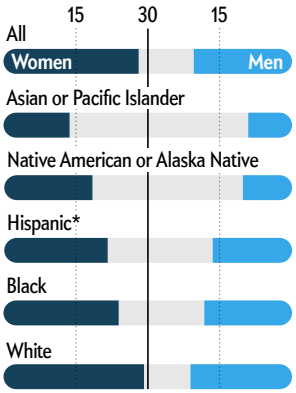
Rheumatoid arthritis, multiple sclerosis and scleroderma are at least 2 to 3 times higher in women.

More women than men are infected by herpes simplex virus 2.

Prevalence of Multiple Sclerosis (cases per 100,000 people, 2015)



Deaths from Alzheimer's Disease (age-adjusted deaths in U.S. per 100,000 people, 2014)



*Includes Hispanic Black and Hispanic white

MENTAL ILLNESS

Twice as many women as men are diagnosed with anxiety or depression.

Almost two thirds of Americans with Alzheimer's disease are women. The *APOE4* gene is more strongly linked to the disease in women. X and Y chromosomes may also play a role.

The number of older U.S. women dying of Alzheimer's is now greater than all U.S. women who die of breast cancer.

Illustrations by Mesa Schumacher, Graphics by Jen Christiansen

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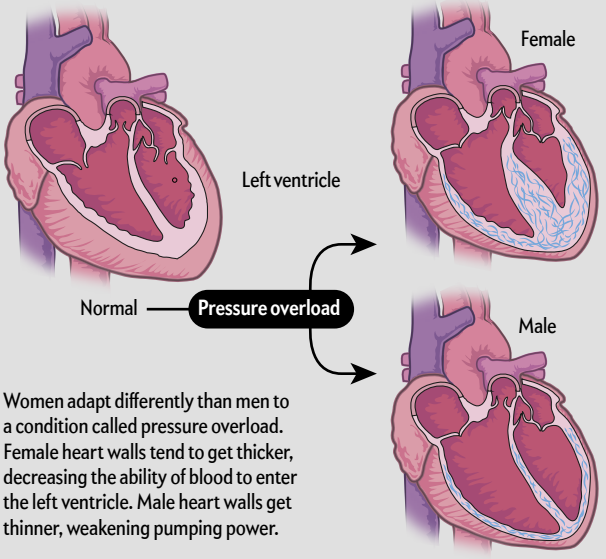
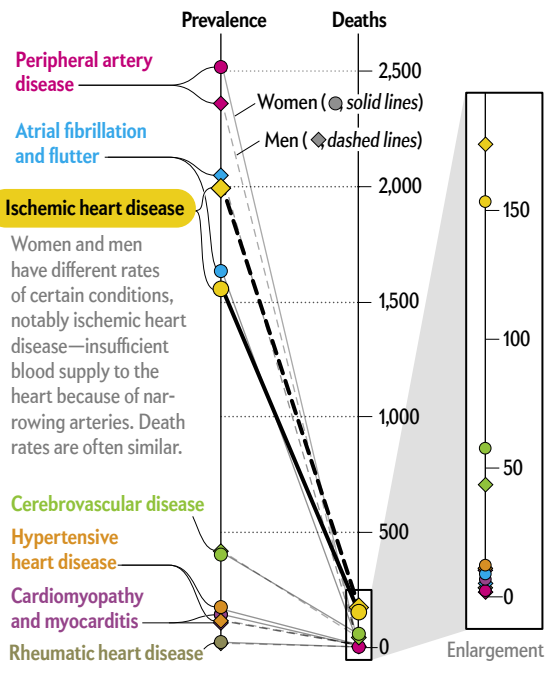
HEART PROBLEMS

Heart complications often take different forms in women and men. Heart failure in women is more likely to result from left ventricle walls that stiffen and thicken (*illustration*). Among electrical problems, an irregular heartbeat is more common in men, while rapid heartbeat is more common in women—and certain drugs can make the condition life-threatening. Heart valve diseases vary, too. Blood clotting is greater in women, which can affect treatments; that trait may have evolved to prevent excess blood loss during childbirth.



Women adapt differently than men to a condition called pressure overload. Female heart walls tend to get thicker, decreasing the ability of blood to enter the left ventricle. Male heart walls get thinner, weakening pumping power.

Cardiovascular and Circulatory Disease
(cases per 100,000 people in U.S., 2015)



Terminology for charts was taken from studies cited.

Sources: "The Recent Prevalence of Osteoporosis and Low Bone Mass in the United States Based on Bone Mineral Density at the Femoral Neck or Lumbar Spine," by Nicole C. Wright et al., in *Journal of Bone and Mineral Research*, Vol. 29, No. 11; November 2014 (*osteoporosis*); "GBD Compare." Institute for Health Metrics and Evaluation, Seattle, Wash. Accessed July 2017; http://vizhub.healthdata.org/gbd-compare (*multiple sclerosis and heart disease*); "Deaths: Final Data for 2014," by Kenneth D. Kochanek et al., in *National Vital Statistics Reports*, Vol. 65, No. 4; June 30, 2016 (*Alzheimer's disease*); "Mechanistic Pathways of Sex Differences in Cardiovascular Disease," by Vera Regitz-Zagrosek and Georgios Kararigas, in *Physiological Reviews*, Vol. 97, No. 1; January 2017 (*heart illustrations*)

two thirds of the more than six million Americans who have Alzheimer's disease are women, not only because more women than men survive to age 65 but also because more women acquire the disease across all age groups.

TIME TO GET PERSONAL

CLEARLY, MEDICAL RESEARCHERS and physicians have a lot of untangling to do before they can offer better health care to women. A deeper understanding of sex differences will improve health directives for men, too. In 2015 the NIH launched a Precision Medicine Initiative to address the problem that most treatments have been designed for the "average patient" instead of different individuals. "Precision" or "personalized" medicine is expected to take into account variability in genes, environment and lifestyle for each person. Yet genome-wide studies that try to pinpoint genetic variants that may be linked to specific diseases have generally excluded X and Y chromosomes, suggesting that sex is not an important focus of precision medicine.

In 2015 the Canadian Institutes of Health Research rolled out an online training course on sex and gender in health research, and the League of European Research Universities released a report on how to integrate sex and gender into research processes. In 2016 the NIH mandated that researchers consider sex as a biological variable in animal and human studies, and a panel of 13 experts representing nine countries developed the Sex and Gender Equity in Research guidelines, a comprehensive procedure for reporting sex and gender information in study design, data analyses, results and interpretation of findings. Despite the initiation in 2015 of U.S. educational summits calling for integrating sex- and gender-based evidence into medicine and education, relatively little progress has been made. Several summits have been held to assess any new developments—the latest was held virtually in November 2021. Advancing understanding of sex and gender differences in health and disease and integrating those perspectives into emerging basic science fields and in translational research and technologies are two of the key themes of the NIH report on women's health research.

We might need further mandates, through policy and funding restrictions, to ensure that female biology makes it into textbooks and testing protocols. We might also need to require best practices—standards of care that must be adhered to as part of the ethical code of "do no harm"—to ensure that clinicians and health-care providers consider both sex and gender in medical diagnoses, screening and treatments. Both women and men would benefit enormously. Without sex and gender as a focus, physicians cannot achieve the precision medicine, specific to each of us, that we all hope to receive. SA

Marcia L. Stefanick is a professor of medicine at the Stanford Prevention Research Center and a professor of obstetrics and gynecology at the Stanford University School of Medicine. She is also director of the Stanford Women and Sex Differences in Medicine Center and is conducting a large trial of older women related to heart disease prevention and healthy aging.

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OPINION

Clinical Trials Need More Diversity

It's unethical and risky to ignore racial and ethnic minorities

By the Editors

Nearly 40 percent of Americans belong to a racial or ethnic minority, but the patients who participate in clinical trials for new drugs skew heavily white—in some cases, 80 to 90 percent. Yet nonwhite patients will ultimately take the drugs that come out of clinical studies, and that leads to a real problem. The symptoms of conditions such as heart disease, cancer and diabetes, as well as the contributing factors, vary across lines of ethnicity, as they do between the sexes. If diverse groups aren't part of these studies, we can't be sure whether the treatment will work in all populations or what side effects might emerge in one group or another.

This isn't a new concern. In 1993 Congress passed the National Institutes of Health Revitalization Act, which required the agency to include more women and people of color in their research studies. It was a step in the right direction, and to be sure, the percentage of women in clinical trials has grown significantly since then.

But participation by minorities has not increased much at all: a 2014 study found that fewer than 2 percent of more than 10,000 cancer clinical trials funded by the National Cancer Institute focused on a racial or ethnic minority. And even if the other trials fulfilled those goals, the 1993 law regulates only studies funded by the NIH, which represent a mere 6 percent of all clinical trials.

The shortfall is especially troubling when it comes to trials for diseases that particularly affect marginalized racial and ethnic groups. For example, Black Americans are more likely to suffer from respiratory ailments than white Americans are; however, as of 2015, only 1.9 percent of all studies of respiratory disease included minority subjects, and fewer than 5 percent of NIH-funded respiratory research included racial minorities.

The problem is not necessarily that researchers are unwilling to diversify their studies. Members of minority groups are often reluctant to participate. Fear of discrimination by medical professionals is one reason. Another is that many ethnic and racial minorities do not have access to the specialty care centers that recruit subjects for trials. Some may also fear possible exploitation, thanks to a history of unethical medical testing in the U.S. (the infamous Tuskegee experiments, in which Black men were deliberately left untreated for syphilis, are perhaps the best-known example). And some minorities simply lack the time or financial resources to participate.

The problem is not confined to the U.S., either. A study of trials involving some 150,000 patients in 29 countries at five different time points between 1997 and 2014 showed that the ethnic makeup of the trials was about 86 percent white.

Drug regulators such as the Food and Drug Administration should create and enforce tougher requirements: for a drug to be approved for market, the patient panels of its clinical trials should closely resemble the makeup of the patient populations who will actually use the candidate medicine. And drugmakers should adopt their own testing policies, including strong standards for diverse patient groups.

The FDA currently requires drug developers to provide extra test results for a candidate drug that may have applications in a special age population—say, older patients. It could apply those same criteria regarding race and ethnicity. These requirements could even extend to a more diverse array of genetic subtypes. Some medicines are ineffective or dangerous in certain genetic populations. For example, carbamazepine, a medication used to treat epilepsy, can cause a severe skin disorder in patients with a particular gene variant found in some people of Asian heritage.

In 2015 the FDA launched the Drug Trials Snapshots program, which makes public the demographic details of clinical trial participants, including their age, sex and race. But the onus is on the patients and their doctors to seek out that information.

It's unethical and dangerous to approve drugs without making every attempt to certify their safety and efficacy. Yet by failing to include members of racial and ethnic minorities in clinical trials, that is just what the FDA is doing. SA

Illustration by Lisk Feng

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OPINION

Racism in Medical Tests

Many diagnostic assessments are inherently biased against people of color

By the Editors

COVID HAS WREAKED HAVOC ON BLACK AND INDIGENOUS communities and other people of color, and U.S. medical institutions should be doing everything they can to root out and eliminate entrenched racial inequities. Yet many of the screening assessments used in health care are exacerbating racism in medicine, automatically and erroneously changing the scores given to people of color in ways that can deny them needed treatment.

These race-based scoring adjustments to evaluations are all too common in modern medicine, particularly in the U.S. To determine the chance of death for a patient with heart failure, for example, a physician following the American Heart Association's guidelines would use factors such as age, heart rate and systolic blood pressure to calculate a risk score, which helps to determine treatment. But for reasons the AHA does not explain, the algorithm automatically adds three points to non-Black patients' scores, making it seem as if Black people are at lower risk of dying from heart problems simply by virtue of their race. This is not true.

A paper published in 2020 in the *New England Journal of Medicine* presented 13 examples of such algorithms that use race as a factor. In every case, the race adjustment results in potential harm to patients who identify as nonwhite, with Black, Latinx, Asian and Native American people affected to various degrees by different calculations. These "corrections" are presumably based on the long-debunked premise that there are innate biological differences among races. This idea persists despite ample evidence that race—a social construct—is not a reliable proxy for genetics: Every racial group contains a lot of diversity in its genes. It is true that some populations are genetically predisposed to certain medical conditions—the *BRCA* mutations associated with breast cancer, for instance, occur more frequently among people of Ashkenazi Jewish heritage. But such examples are rare and do not apply to broad racial categories such as "Black" or "white."

The mistaken conflation of race and genetics is often compounded by outdated ideas that medical authorities (mostly white) have perpetuated about people of color. For example, one kidney test includes an adjustment for Black patients that can hinder accurate diagnosis. It gauges the estimated glomerular filtration rate (eGFR), which is calculated by measuring creatinine, a protein associated with muscle breakdown that is normally cleared by the kidneys. Black patients' scores are automatically adjusted because of a now discredited theory that greater muscle mass "inherent" to Black people produces higher levels of the protein. This practice inflates the overall eGFR value, potentially disguising real kidney problems. The results can keep Black patients from getting essential treatment, including transplants. Citing these issues, medical student Naomi Nkinsi successfully pushed the University of Washington School of Medicine to abandon the eGFR race adjustment in 2020.

A 2019 study in *Science* examined an algorithm that is used throughout the U.S. health system to predict broad-based health risks. The researchers looked at one large hospital that used this algorithm and found that, based on individual medical records, white patients were actually healthier than Black patients with the same risk score. This is because the algorithm used health *costs* as a proxy for health *needs*—but systemic racial inequality means that health-care expenditures are higher for white people overall, so that the needs of Black people were being underestimated. In an analysis of these findings, sociologist Ruha Benjamin, who studies race, technology and medicine, observes that "today coded inequity is perpetuated precisely because those who design and adopt such tools are not thinking carefully about systemic racism."

The algorithms that are harming people of color could easily be made more equitable, either by correcting the racially biased assumptions that inform them or by removing race as a factor altogether when it does not help with diagnosis or care. The same is true for devices such as the pulse oximeter, which is calibrated to white skin—a particularly dangerous situation in the COVID pandemic, where nonwhite patients are at higher risk of serious lung infections.

Leaders in medicine must prioritize these issues now to give fair and often lifesaving care to the people left most vulnerable by an inherently racist system. SA

Illustration by Deborah Lee

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3

ENVIRONMENTAL JUSTICE

54 The Environmental Cost of Inequality

60 Toxic Inequality

62 Unheard Voices

64 More Food, Less Waste

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The Environmental Cost of Inequality

Power imbalances facilitate environmental degradation—and the poor suffer the consequences *By James K. Boyce*

IN THE FALL OF 2016 AN ENVIRONMENTAL STRUGGLE IN RURAL NORTH DAKOTA MADE headlines worldwide. The local Standing Rock Sioux Tribe and climate activists were pitted against the corporate and government backers of the Dakota Access Pipeline, which was being built to carry oil from the state's Bakken shale fields to a terminal in Illinois. Private security guards unleashed attack dogs on protesters, and the police blasted them with water cannons in freezing weather.

The tribe feared that a leak in the pipeline as it crossed under a reservoir along the Missouri River would contaminate its water supply. Climate activists joined the protest to fight ramped-up extraction of fossil fuels. Supporters of the $3.8-billion project argued that it would save the oil industry money, being less costly than the alternative of oil shipment by rail, and that its construction would bring jobs with multiplier effects to the local economy. Because the price of oil is set on world markets, the cost saving would not mean lower prices for consumers—but it would bring higher profits to producers.

By December 2016 the U.S. Army Corps of Engineers announced that it would deny approval for the pipeline crossing, a decision greeted with whoops of joy at the protesters' encampment. But four days after taking office the following January, President Donald Trump overturned the ruling, and a few months later the oil began to flow.

The battle reflected what seems to be a basic reality: When people who could benefit from using or abusing the environment are economically and politically more powerful than those who could be harmed, the imbalance facilitates environ-

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mental degradation. And the wider the inequality, the more the damage. Furthermore, those with less power end up bearing a disproportionate share of the environmental injury.

We see these situations all around us. Polluting power plants and hazardous waste dumps are located in poor neighborhoods. Drinking-water impurities afflict minority communities. But is this relation between power and environmental degradation consistently true? If so, why? And what can we do about it? At Standing Rock, the balance between the opposing sides was close; Trump's election was enough to tip the scales. But the experience, along with some recent shifts in power balances, offers lessons—and even hope—that efforts to reduce economic and social inequality will be good not only for people but also for the environment.

GREATER INEQUALITY, GREATER HARM

RESEARCH on the connection between social power and environmental degradation began in earnest in the 1990s. Economists reported that they had found an inverted U-shaped relation between pollution and per capita income. They plotted air and water pollution on the *y*-axis of a graph and average income on the *x*-axis, comparing dozens of countries. Pollution initially increased as income went from $0 to a turning point of up to about $8,000 a year. But after that, pollution decreased as income rose further. This became known as the environmental Kuznets curve because of its similarity to the relation between inequality and average income found in a famous 1955 study by economist Simon Kuznets.

The environmental Kuznets curve appeared to offer respite from the bleak assumption that rising production and consumption necessarily lead to more environmental damage. Maybe humans were not, as environmental historian Roderick Nash once put it, a "cancerous" species whose growth "endangers the larger whole." A spirited debate ensued among analysts who saw economic growth as the solution to environmental woes and those who still saw it as the crux of the problem.

I was not convinced by either side. Maybe that was because in my 20s, I had lived among some of the world's poorest people in a Bangladesh village. That experience left me with the indelible understanding that human societies cannot be neatly summed up by population or per capita data. Many Bangladeshis went hungry but not because the country had too many people or too little food per person. There was enough food for everyone, yet communities starved because the poor lacked the purchasing power to buy it in the market and the political power to obtain it by other means. In his 1981 book *Poverty and Famines,* economist Amartya Sen explains that famines typically arise from similar realities. Inequality in the distribution of wealth and power seems to be central to how societies function and malfunction.

In thinking about the original and environmental Kuznets curves, it occurred to me that inequality, not per capita income, might underlie environmental degradation: the two seemed to rise and fall together. When then Ph.D. student Mariano Torras and I reanalyzed the environmental Kuznets curve data in 1998, we found that countries with lower rates of adult literacy, fewer political rights and civil liberties, and higher income inequality—which we considered to be indicators of more unequal distributions of power—tended to have more polluted air and water. After controlling for these indicators, the apparent effect of per capita income weakened, and for some pollutants, it disappeared entirely. We also found that greater inequality was associated with less access to clean drinking water and sanitation facilities, both crucial to the environment and human well-being.

In a 1999 follow-up study, my co-authors and I examined the 50 U.S. states. We analyzed the relation between the strength of state environmental policies and the distribution of power, using as proxies the rate of voter participation, the percentage of adults completing high school, tax fairness and Medicaid access. We found that wider inequality was associated with weaker environmental policies and that weaker policies were associated with more environmental stress and poorer public health. These results suggested that the pathways by which inequality adversely affects health include not only physiological stress, violence and reduced access to health care—all of which had been documented by public health researchers—but also impacts on the environment.

The initial reactions to our findings were decidedly cool. In the 1990s, when free markets and deregulation were all the rage, concerns about inequality were brushed aside as passé, maybe even soft-headed. One reviewer claimed that I was "beating a dead horse."

In the 2000s, however, inequality reemerged as a central political issue. The growing gap between the "1 percent" and everyone else, the terrible toll of Hurricane Katrina on low-income residents in New Orleans and the economic dislocations that followed the 2008 financial crisis all helped to put it back on the agenda. At the same time, evidence mounted that more concentrated wealth and political power leads to worse environmental performance—and not just in terms of air and water pollution. Researchers found that the proportion of plants and animals threatened with extirpation or extinction is higher in countries with more unequal income distributions. Rates of deforestation are higher in countries with greater corruption. Public expenditure on environmental research and development and patents on environmental innovations are lower in industrial nations with greater income inequality. More inequality has also been linked to higher carbon emissions per person and per unit of gross domestic product.

These findings make sense when we consider that with less inequality, people are better able to defend the air, water and natural resources on which their

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health and well-being depend. Protecting the environment and reducing inequality go hand in hand.

POWER RULES

ANY ACTIVITY THAT CAUSES environmental degradation generates winners as well as losers. The activity benefits some people—otherwise no one would pursue it. And some people bear the costs—otherwise the degradation would not be seen as a problem. This poses a basic question: Why can those who benefit from such activities impose environmental costs on others?

There are three possible answers, all of them related to power disparities. One is that the costs are deferred, borne by future generations, who are not here today to defend themselves. In such cases, as when we think of the long-term impacts of climate change, the only way to safeguard the environment is for those of us who are alive to take responsibility toward those "whose faces are yet beneath the surface of the ground, the unborn of the future Nation," in the words of the Iroquois Constitution.

A second possibility is that people who are harmed are unaware of being hurt or do not know where the harm comes from. They may realize, for example, that their children are getting sick but not that the illness can be traced to emissions from a nearby refinery or power plant. In such cases, the solution lies in greater access to knowledge and, in particular, in policies that guarantee the public's right to know about environmental hazards and their sources.

The final possibility is that even when people are well aware that they are bearing the brunt of environmental costs and know the sources, they lack sufficient economic and political power to prevail in social decisions about the use and abuse of the environment. Standing Rock is an example. The solution in such cases is to change the balances of power.

Government decisions affecting the environment often invoke a cost-benefit analysis: How much benefit can be gained and at what cost? In this calculation, economic power (also known as purchasing power) plays a key role. People with more dollars effectively wield more "votes."

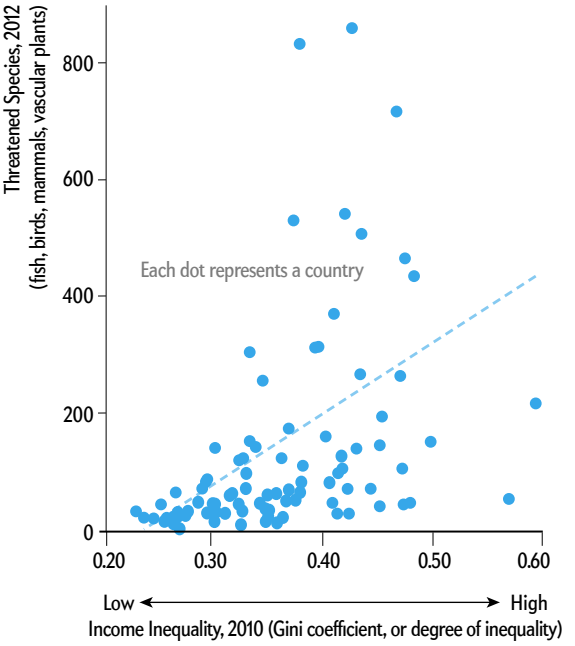
When the people who could be harmed have little or no political power, decision makers can minimize or ignore the costs. An extreme example is the cost-benefit case the U.S. Environmental Protection Agency made under the Trump administration for repealing the Clean Power Plan. It assigned a value of zero to all climate impacts outside the U.S., reasoning that harms to people not in the country should not be considered in the making of U.S. climate policy.

Purchasing power and political power tend to be correlated: those with more dollars often have more political influence, and vice versa. Their joint effect can be described by a concept I call the power-weighted social decision rule. It means that the weight assigned to the costs and benefits from environmentally degrading activities depends on the power of the people to whom those accrue. When those who benefit from environmentally degrading activities are wealthy and powerful, compared with those who are harmed, social decisions favor the winners over the losers. The greater the inequality between rich and poor and between the more powerful and the less powerful, the greater the extent of environmental degradation.

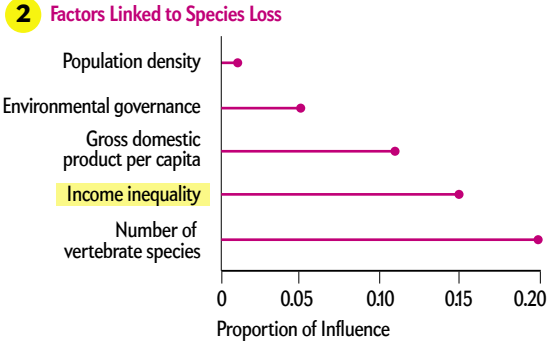
More Inequality, Fewer Species

Many studies show that as the gap between rich and poor people widens, the extent of environmental damage increases. For example, one analysis found that countries with higher income inequality also have higher rates of species classified as threatened by the International Union for Conservation of Nature (1). A separate report determined that income inequality is more strongly correlated with species loss than other major factors such as population density and even environmental policies (2). Only the total number of species had greater influence.

1 Species Threatened in Countries Worldwide



2 Factors Linked to Species Loss



Power inequality also exacerbates the neglect of future generations and lack of knowledge about environmental costs. When inequalities are wide, the imperatives of day-to-day sur-

Sources: "Inequality and Environmental Sustainability," by S. Nazrul Islam. United Nations Department of Economic and Social Affairs Working Paper No. 145. United Nations, August 2015 (*number of species threatened*); "A Cross-National Analysis of How Economic Inequality Predicts Biodiversity Loss," by Tim G. Holland, Garry D. Peterson and Andrew Gonzalez, in *Conservation Biology*, Vol. 23, No. 5, October 2009 (*factors linked to species loss*)

Graphics by Jen Christiansen

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vival for the very poor may overshadow worries about tomorrow; among the very rich, fear that their sway will eventually end can foster a cut-and-run attitude toward natural resources (exemplified by the rapacious deforestation of Southeast Asia in the 1960s and 1970s under such dictators as the Philippines' Ferdinand Marcos and Indonesia's Suharto). And when inequalities are wide, the poor are more likely to lack access to information, including about the nature and causes of the environmental harms to which they are subjected.

HEADS I WIN, TAILS YOU LOSE

THE POWER-WEIGHTED social decision rule predicts not only that greater inequality will lead to greater environmental harm but also that the harm will be concentrated in communities at the lower end of the wealth-and-power spectrum. In those places, environmental costs carry less weight in the eyes of decision makers. Racial and ethnic minorities and low-income communities are at greatest risk. The Standing Rock reservation, where 37 percent of residents fall below the federal poverty line (triple the national rate), was vulnerable on both counts.

At the same time, the benefits from environmentally degrading activities—higher profits for producers and lower prices for consumers—are concentrated at the upper end of the economic spectrum. Profits flow to shareholders and corporate executives, who generally are relatively well off. And the more that consumers spend, the more they benefit from lower prices, again bestowing greater benefits on the well-to-do.

This is not to say that affluent people do not want a clean and safe environment. But to a substantial extent, environmental quality is what economists call an impure public good. It is not equally available to everyone. Well-off people can afford to live in cleaner places, buy bottled water and air conditioners, and get better medical care. They can also more effectively oppose having environmental hazards placed in their neighborhoods. By being further removed from environmental harms, they can more easily afford to ignore them. Even when they cannot altogether escape the consequences of environmental degradation, they weigh a relatively small share of the costs against a relatively large share of the benefits.

ENVIRONMENTAL INJUSTICE

SINCE THE 1980S researchers have systematically documented the disproportionate exposure of racial and ethnic minorities and low-income communities to environmental hazards in the U.S. One of the earliest studies, by sociologist Robert Bullard, examined the spatial distribution of hazardous-waste sites in Houston and found them to be located primarily in Black neighborhoods.

Subsequent studies have revealed similar patterns in many parts of the country: race and ethnicity correlate strongly with proximity and exposure to environmental harms. In multivariate analyses, race and ethnicity turn out to be even stronger predictors of pollution exposure than low income, testifying to the enduring salience of racism in the distribution of power in the U.S. The most hard-hit communities are often those where disadvantages of race and class intersect.

Researchers have also investigated how the correlations can be explained. One controversy that arose was about timing: Are hazardous facilities sited from the outset in communities with less wealth and power? Or, after a facility is sited, do wealthier residents move out, property values decline and poorer people move in? Few studies have explored this question directly, but those that did have found strong evidence that such toxic facilities are sited from the start in communities with less power. The evidence also indicates that in cases where more well-to-do people leave after a facility is built, the trend had already begun before the siting, suggesting that communities in transition are more vulnerable to having environmental hazards imposed on them.

Disproportionate pollution exposure hurts children in particular, resulting in higher rates of infant mortality, lower birth weights, a higher incidence of neurodevelopmental disabilities, more frequent and intense asthma attacks, and lower school test scores. Among adults, exposure is linked to work days lost to illnesses and the need to care for sick children. Over time these health effects reinforce the disparities that make com-

OBJECTION to the Dakota Access Pipeline in North Dakota by local Native Americans concerned about contaminated water supplies grew to a larger protest nationwide against corporations and politicians having more power than underserved communities.

Jim Watson/Getty Images

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munities more vulnerable to environmental harm in the first place.

Although the effects are most severe for at-risk communities, they often spill over to wider populations. For example, U.S. metropolitan areas with more residential segregation along racial and ethnic lines tend to have higher cancer risks from air pollution for everyone, not only for people of color. In cities that rank in the top 5 percent nationally for racial and ethnic disparities in industrial air pollution exposure, the average exposure for non-Hispanic whites is significantly higher than in those where pollution disparities are smaller. Environmental justice is good for everyone.

Environmental inequalities can be found everywhere. In England and the Netherlands, poorer and more nonwhite neighborhoods have higher air concentrations of particulate matter and nitrogen oxides, which aggravate respiratory problems. In Delhi, whose residents breathe some of the world's dirtiest air, the poor live in some of the most polluted neighborhoods. They also spend more time working outdoors, including along roadways, where air pollution loads are most extreme. They cannot afford air conditioning or air purifiers. At the same time, they obtain fewer benefits from the power generation, transportation and other industries that cause the pollution.

The power-weighted social decision rule operates at the international scale, too. Environmental harm is unduly inflicted on the poorest countries. In a 1991 memorandum, Lawrence Summers, then chief economist at the World Bank, wrote that "the economic logic behind dumping a load of toxic waste in the lowest-wage country is impeccable" because the foregone earnings from illnesses and deaths there will be lowest. His statement may have been tongue-in-cheek, but environmental practice often follows this script. Every year millions of tons of toxic waste are shipped from advanced industrial countries to low-income nations in Africa, Asia and Latin America.

The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, an international environmental agreement that took effect in 1992, has proved inadequate to halt this flow. The distance between people who benefit from the economic activities that generate the waste and those who bear the costs of its disposal gives a painful new twist to the adage "out of sight, out of mind."

THE NEW ENVIRONMENTALISM

SO WHAT CAN WE DO to lessen social and environmental inequality, thereby reducing harm to people and the planet?

The relation between inequality and the environment is a two-way street. Reducing inequality in the distribution of wealth and power helps to bring about a greener environment. And efforts to advance the right to a clean and safe environment help to bring about greater equality. The key to both is active mobilization for change.

U.S. environmentalism in the 20th century aimed to protect nature from people. Enlightened elites often saw themselves as defenders of nature from the irresponsible masses. From there it was a short step to assume an inexorable trade-off between environmental protection and broad-based economic well-being.

In the 21st century we are witnessing the ascendance of a new environmentalism. The aim is to protect individuals who face harm from people who profit from degradation. The balance of power between these two sides can and does change over time. When climate activists from across the country joined Native Americans at Standing Rock, defending their right to a clean and safe environment, the power-balance scales began to move. The protesters, building on past achievements of movements across the country for equal rights and environmental protection, again came close to halting a multibillion-dollar enterprise in 2020, when a federal judge ordered the Army Corp of Engineers to undertake a new environmental review of the pipeline.

> When people who could benefit from using or abusing the environment are economically and politically more powerful than those who could be harmed, the imbalance facilitates environmental degradation.

Similarly, in Washington State, activists succeeded in blocking a proposed coal export terminal that would have been the largest in the country, protecting lands and waters of tribal communities. In Montana, the Blackfeet Nation won the cancellation of energy leases on 23,000 acres, the culmination of a 30-year struggle.

The intimate links between inequality and the environment have led to growing recognition that if we want to rebalance human relationships with nature, we also need to rebalance our relationships with one another. SA

James K. Boyce is a professor emeritus of economics and senior fellow at the Political Economy Research Institute at the University of Massachusetts Amherst. He is author of *Economics for People and the Planet: Inequality in the Era of Climate Change* (Anthem Press, 2019).

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Toxic Inequality

A trend of disproportionate exposure to deadly air pollution among Asian, Hispanic and Black people persists in most cases regardless of the emission source, a study finds

By Robin Lloyd

COMMUNITIES OF COLOR IN THE U.S. HAVE LONG REPORTED HEALTH problems from heavy exposure to polluted air. In recent decades a growing body of data have bolstered these reports by showing that Asian, Black and Hispanic people are exposed to relatively higher concentrations of potentially deadly air pollution on average, compared with white people. But some policy makers have questioned whether these trends hold across sources of such pollution, which can vary regionally and range from tailpipe exhaust on highways to emissions related to construction or commercial cooking.

A 2021 study in *Science Advances* erases a great deal of any doubt that might have existed about racial and ethnic disparities in exposure to air pollution emitted from a variety of sources. The paper reveals that the same exposure disadvantages for people of color collectively persist across 12 of 14 groups of emission sources that spew a particularly dangerous type of air pollution: fine particles with a diameter of 2.5 microns or smaller, known as PM2.5. They are small enough to carry hundreds of chemicals deep into the lungs, where they cause respiratory and heart disease. Fine-particle air pollution is one of the largest environmental causes of death globally, according to a 2020 analysis by the Institute for Health Metrics and Evaluation at the University of Washington. And sources cited by the newer study show that exposure to such pollution causes between 85,000 and 200,000 premature deaths in the U.S. annually.

The air pollution impact on each racial or ethnic minority group—Black, Hispanic and Asian people—persisted even when the researchers controlled for the state in which people resided or for whether they lived in an urban or rural region. And the disproportionate pollution impact held among people of color as a group regardless of household income.

The researchers also break down the relative source-exposure trends for each minority group, compared with those for white people, whose overall exposure is lower than the national average. Hispanic and Asian people are exposed to higher-than-average concentrations of fine-particle emissions from most of the different source types, the analysis shows. For Black people, the exposure disadvantage holds across all 14 groups of emission sources.

"When we started this project, we were thinking that we would see what the main sources of air pollution are behind this injustice—and then we could say, 'We can fix those and solve this problem,'" says study leader Christopher W. Tessum, an environ-

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mental engineer at the University of Illinois at Urbana-Champaign. "What we found instead is that it's actually almost all of the source types of air pollution that are causing the disparity. It's really just everything that's stacked against people of color and exposing them more to air pollution."

Fine-particle pollution emissions from construction, motor vehicles and industrial sources are often among the largest disparities in average exposures of ethnic and racial minority groups, compared with exposures of white people, the team found.

The results are not surprising, says environmental engineer and environmental justice researcher Regan Patterson, who was not involved in the study. But they are significant for the role they can play in substantiating the experiences of the Black community and other communities of color with air pollution and its ill effects—particularly when community members and advocacy groups give testimony about environmental impacts at public hearings or push for policy changes.

"A lot of community organizers have been doing this work; however, it's important to have the data because it is often stated that if there's no data, it doesn't exist," says Patterson, a transportation equity research fellow at the Congressional Black Caucus Foundation.

To estimate the fine-particle pollution sources' impact on racial and ethnic groups, the team started with 2014 data from the Environmental Protection Agency's National Emissions Inventory. The researchers ran a computer model to trace the average concentrations of fine-particulate matter emissions caused by more than 5,400 types of pollution sources, yielding exposure levels affecting regions at the level of neighborhood blocks. The sources were grouped into 14 types of emitters, and the concentrations were mapped to racial and ethnic self-identification data from the U.S. Census.

Tessum says the findings point to a problem inherent in clean-air policies that have successfully reduced air pollution nationwide in recent decades: such strategies will not eliminate the extra air pollution and associated health risks experienced by people of color.

And the strength of the racial and ethnic trends across the dozen or more groups of emission sources suggests that solutions to these air pollution disadvantages are not as simple as targeting a single industry or eliminating certain types of industrial steam boilers or other equipment. "What popped out to us was just how pervasive the problem was," says University of Minnesota biosystems engineer Jason Hill, a co-author of the paper. "It's systemic. I'm not going to beat around the bush: this is the product of a long history of racism in this country."

Patterson says efforts to reduce air pollution should target and benefit disproportionately affected communities and should address inequities that persist despite existing national or broad-stroke regulations.

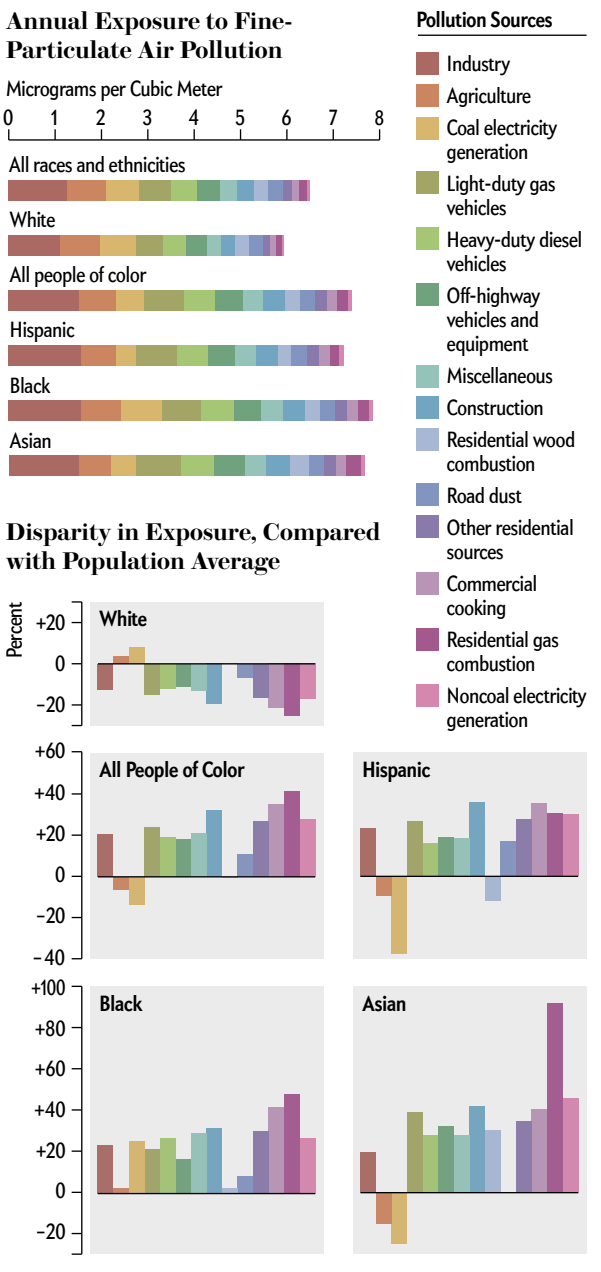
To eliminate the air pollution burden on people of color and the larger consequences it has for society, Tessum says policy makers should also ensure that discussions of regulatory remedies are primarily guided by the experiences, needs and hard-won expertise of the affected communities—and by organizations that advocate for those who are most affected. SA

Robin Lloyd is a science writer based in New York City and a contributing editor at *Scientific American*.

Source: "PM2.5 Polluters Disproportionately and Systemically Affect People of Color in the United States," by Christopher W. Tessum et al., in *Science Advances*, Vol. 7, 2021

Systemic Racism Is in the Air

In the U.S., Black, Hispanic and Asian individuals, as well as people of color as a group, are exposed to higher levels of fine-particulate matter, on average, than white individuals across the majority of emission sources. The sectors of the economy that emit absolute pollution levels with the highest disparities that disadvantage people of color include construction, motor vehicles and industry. In the data shown here, those identified as Hispanic may be of any race, and all other groups are non-Hispanic. The category "all people of color" includes all races and ethnicities except for non-Hispanic white.



Graphic by Amanda Montañez

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Unheard Voices

Vaccine inequality is shutting out the most vulnerable people from plans to save the planet

By Nnimmo Bassey

FOR DECADES A GLOBAL ECONOMIC SYSTEM BASED on the conversion of nature into profit has been accelerating inequality, environmental destruction and climate change. Hundreds of millions of people are vulnerable to (seemingly) natural disasters, including pandemics caused by the emergence of novel pathogens. By exacerbating xenophobic nationalism and precipitating vaccine apartheid, COVID-19 has intensified these dangerous trends.

People from the Global South have always been underrepresented at international conferences where road maps for the future are etched. Now the barriers to participation are prohibitive. With the voices of those worst impacted by biodiversity loss and climate change being muffled by COVID-related constraints, corporations and other winners of the neoliberal order are seizing decision-making processes on these crucial and urgent issues, to the detriment of people and the biosphere.

The one major event since the pandemic began that was not impacted by COVID-related restrictions was the United Nations Food Systems Summit, held on September 23, 2021. That is because it was shunned by more than 300 civil-society groups representing scientists, farmers and Indigenous peoples for being at best indifferent, and at worst hostile, to their views. As the Alliance for Food Sovereignty in Africa (AFSA), which represents more than 200 million African food producers and others, observed, the summit had been structured to give undue influence over global agricultural systems to multinational corporations and their allies. As a result, the summit was bound to "echo the business-as-usual, quick-technofix policy prescriptions of the agribusiness agenda," AFSA argued. The boycott, along with an alternative summit that focused on food sovereignty, may have fended off what many observers feared was an attempt by global capital to control the future of agriculture.

But COVID constraints ensured that civil society was barely represented at the U.N. Biodiversity Conference in October 2021, where delegates from 195 nation-states and the European Union met to discuss a plan to protect 30 percent of the planet by 2030. Many Indigenous groups, who have ample reason to fear violent eviction from and dispossession of the ecosystems they protect as nation-states use "30 by 30" as an excuse to seize their territories, opposed the plan. But with their participation limited to brief online appearances, they were unable to explain their concerns or provide their alternative visions for biodiversity conservation.

Most disastrously impacted by the pandemic was COP26, the 26th Conference of Parties to the U.N. Framework Convention on Climate Change, held in Glasgow, Scotland, in October-November 2021. Climate activists condemned the conference as the most exclusionary COP ever, with delegates facing severe COVID-related restrictions for entering the U.K. and accessing the venue. The COP26 Coalition, representing grassroots activists from around the world, announced as the conference began that two thirds of the thousands of delegates it represented had given up on attending it.

It was double trouble for delegates from nations red-listed for COVID, who had to quarantine in hotels for days on

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arrival in the U.K. After passing the hurdles of obtaining visas and covering expensive travel costs, many negotiators were excluded from the conference halls and had to watch the proceedings from screens in their rooms—which they could just as well have done from their home countries. COVID protocols required some side events to have only panelists speaking before cameras, excluding the possibility of discussion. And with only two seats assigned for national delegates in each negotiating room, officials were denied access to needed technical backup.

All told, the fossil-fuels sector had an outsize influence on a conference that should have been about curtailing its damaging activities. There were a whopping 503 representatives of fossil-fuel companies, more than any nation's delegation, and no participants at all from 11 out of 14 Pacific Island states, which are the worst affected by climate change. The voices of those living in sacrifice zones and demanding real climate action—keeping fossil fuels in the ground—were shut out. The outcome was a lot of hot air, which did not even include a pledge to phase out coal.

Disproportionately impacting those who already suffer the most and will continue to suffer the most, pandemic-era exclusions mean that multilateral events can no longer be counted on to solve the existential challenges confronting the world. Instead COVID is enabling the entrenchment of exploitative and false solutions to impending catastrophes.

Nnimmo Bassey is director of the Health of Mother Earth Foundation, based in Nigeria. His books include *To Cook a Continent: Destructive Extraction and the Climate Crisis in Africa* (Pambazuka Press, 2012).

Illustration by Hanna Barczyk

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More Food,

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Less Waste

Cutting losses across the food chain could vastly increase supply and significantly reduce carbon emissions

By Chad Frischmann and Mamta Mehra

Graphics by Valentina D'Efilippo

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IMAGINE GOING TO THE MARKET, LEAVING WITH THREE FULL BAGS OF GROCERIES and coming home. Before you step through your door, you stop and throw one of the bags into a trash bin, which later is hauled away to a landfill. What a waste. Collectively, that is exactly what we are doing today. Globally, 30 to 40 percent of food intended for human consumption is not eaten. Given that more than 800 million people go hungry every day, the scale of food loss fills many of us with a deep sense of anguish.

If population growth and economic development continue at their current pace, the world will have to produce 53 million more metric tons of food annually by 2050. That increase would require converting another 442 million hectares of forests and grassland—far greater than the size of India—into farmland over the next 30 years. The escalation would also release the equivalent of an additional 80 billion tons of carbon dioxide over the next 30 years—about 15 times the emissions of the entire U.S. economy in 2019. Food waste already accounts for roughly 8 percent of the world's greenhouse gases.

There is another path, however. Our group at Project Drawdown, an international research and communications organization, completed an exhaustive study of existing technologies and practices that can significantly reduce greenhouse gas levels in the atmosphere while ushering in a more regenerative society and economy. Reducing food waste is one of the top-five means of achieving these goals among 76 we analyzed. Basic adjustments in how food is produced and consumed could help feed the entire world a healthy, nutrient-rich diet through 2050 and beyond without clearing, planting or grazing more land than is used today. Providing more food by eliminating waste, along with better ways of producing that food, would avoid deforestation and also save an enormous amount of energy, water, fertilizer, labor and other resources.

Opportunities to reduce waste exist at every step along the supply chain from farm to table. We harvest crops, raise livestock, and process these commodities into products such as rice, vegetable oil, potato chips, perfectly cut carrots, cheese and New York strip steaks. Most of these products are packaged in cardboard boxes, plastic bags and bottles, tin cans and glass jars made from extracted materials in industrial factories, and then they are shipped on gas-guzzling trucks, trains and planes all over the world.

After arriving at stores and restaurants, food is held in energy-hungry refrigerators and freezers that use hydrofluorocarbons—powerful greenhouse gases—until purchased by consumers, whose eyes are often bigger than their appetites, particularly in richer communities. In high-income countries, restaurants and households turn on their energy-consuming stoves and ovens, and in developing nations, billions of people burn biomass in noxious cookstoves that spew polluting, unhealthy smoke and black carbon.

After all these waste-producing activities, too much of the food that makes it to a consumer's table is thrown in the garbage, which then is typically transported by fossil-fueled trucks to landfills where it decomposes and emits methane, another potent greenhouse gas. Tossing that leftover lasagna accounts for far more emissions than a rotting tomato that never leaves the farm gate. We can do better.

SMALLER FOODPRINT

AT PROJECT DRAWDOWN, we poured global data from the Food and Agriculture Organization and many other sources into a detailed model of the entire food production and consumption system. The model took into account rising population projections, as well as greater consumption and more meat eating per person, particularly in developing countries, based on actual trends over the past several decades. According to our calculations, healthier diets and more regenerative agricultural production lead to a lower "foodprint"—less waste, fewer emissions and a cleaner environment.

If half of the world's population consumes a healthy 2,300 kilocalories a day, built around a plant-rich diet, and puts into practice already proven actions that cut waste across the supply chain, food losses could decline from the current 40 percent to 20 percent, an incredible savings. If we were even more ambitious in following the same practices, food waste could be cut to 10 percent [*see graphics on pages 67–70 for details*].

These hefty savings would result partly from shifts in basic habits. In the developed world, embracing an average daily 2,300-kilocalorie diet instead of consumption that often reaches more than 3,000 kilocalories lessens food waste in the first place. In the developing world, caloric and protein intake generally need to rise to reach nutritious levels, which may increase some waste across the system. But overall, if everyone on the planet adopted healthy consumption practices and a plant-rich (not necessarily vegetarian) diet, 166 million metric tons of food waste could be avoided over the next 30 years. Feedback would be sent across the supply chain to increase crop production and decrease animal production.

Reducing waste by adjusting how food is produced and consumed can greatly help the environment as well. Different types

Continued on page 71

fcafotodigital/Getty Images (*preceding pages*)

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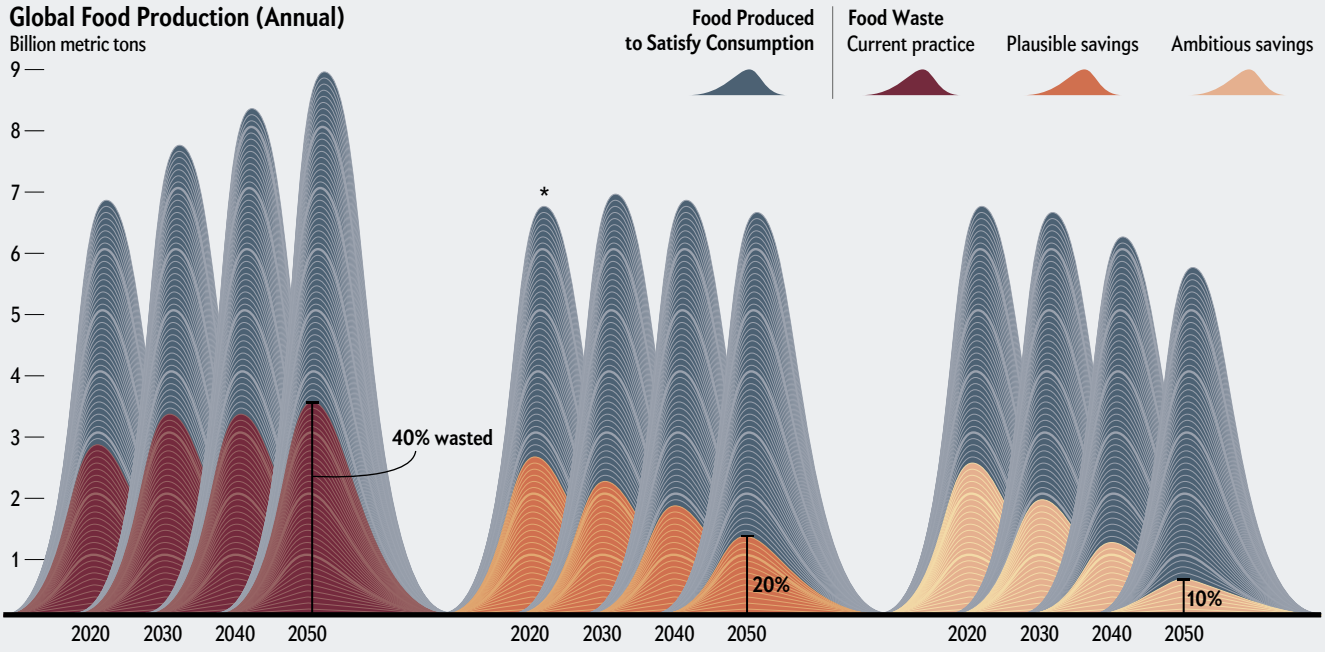
Piles of Food Wasted Worldwide

A troubling 40 percent of food produced is lost across the supply chain from farm to table. A basic shift toward lessening excessive consumption and toward more plant-based diets, while also applying waste-saving practices at every step, could cut losses dramatically. Such measures would provide food for millions of people who go hungry and greatly reduce water depletion, energy use and carbon emissions.



CURRENT PRACTICE

This baseline scenario assumes that global population and consumption per person continue to rise as they have over the past several decades; 40 percent of food produced is wasted.

PLAUSIBLE SAVINGS

If half the world's people consume 2,300 kilocalories a day and choose more plants and less meat, and losses are reduced across the supply chain, waste could be cut to 20 percent by 2050.

AMBITIOUS SAVINGS

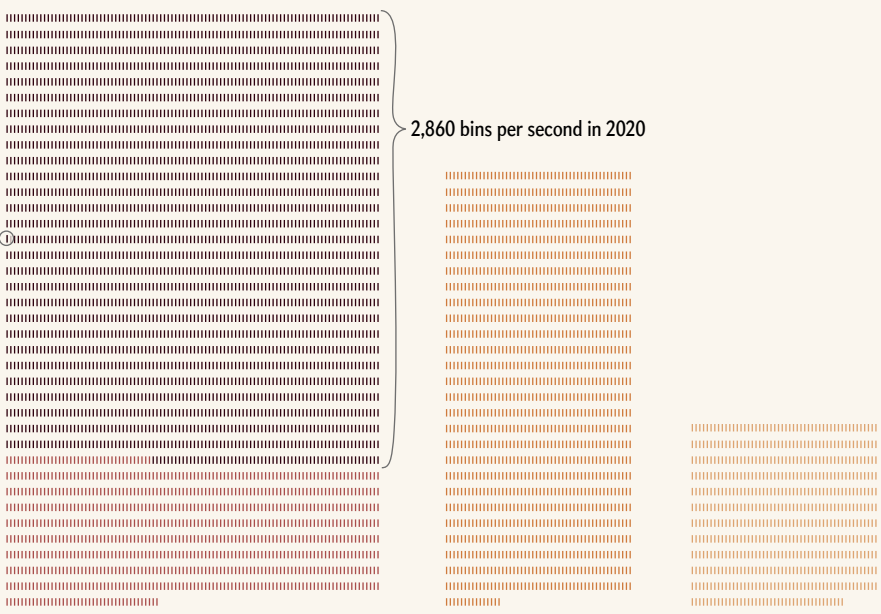
If three quarters of Earth's population follows the same measures described in the "plausible" scenario, waste could drop to 10 percent.

**Projections begin with 2018, so 2020 values are slightly different for each scenario.*

Trashed: Every Second the World Wastes 2,860 Garbage Bins of Food

Each year 2.7 billion metric tons of food are lost in production, distribution and consumption. That would fill 2,860 curbside trash tote bins every second.

Losses are expected to grow to 3,741 bins per second by 2050 if current trends and practices continue. That amount could be cut to 1,365 bins per second by 2050 if the set of plausible solutions is achieved. Losses could be further reduced to 591 bins per second if the world embraces the set of ambitious solutions.


2,860 bins per second in 2020
3,741 bins per second in 2050 if current practices continue
1,365 bins per second in 2050, according to the plausible plan
591 bins per second in 2050, according to the ambitious plan

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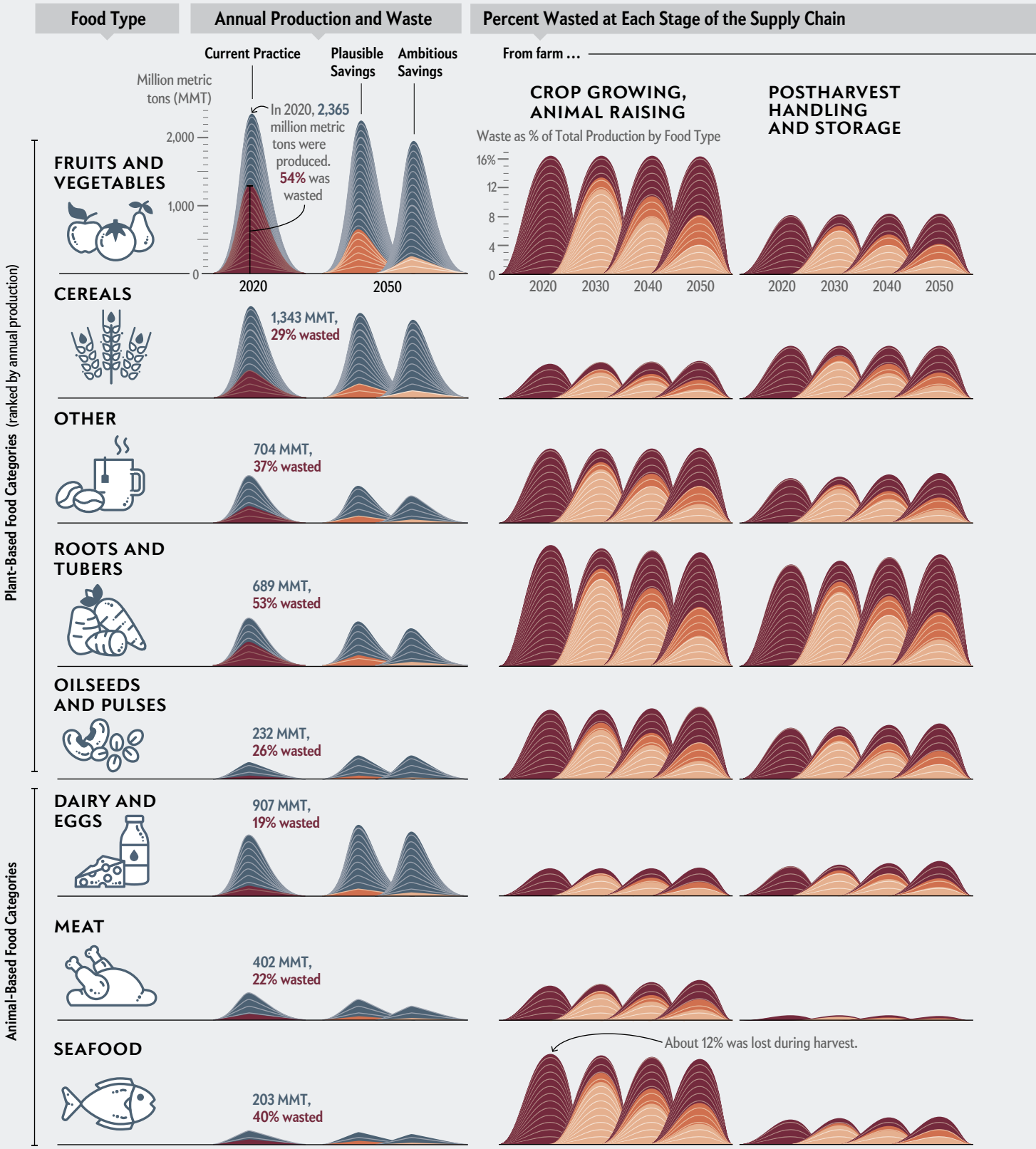
Food Lost, and Possible Reductions, across the Supply Chain

Plant and animal food intended for human consumption is lost across every stage of the supply chain, from field to fork. The numbers here are global averages, but in low-income countries, more waste occurs in the early stages, such as farming and storage. In high-income countries, more waste happens in the late stages, notably markets, restaurants and homes. Solutions will therefore vary by location.



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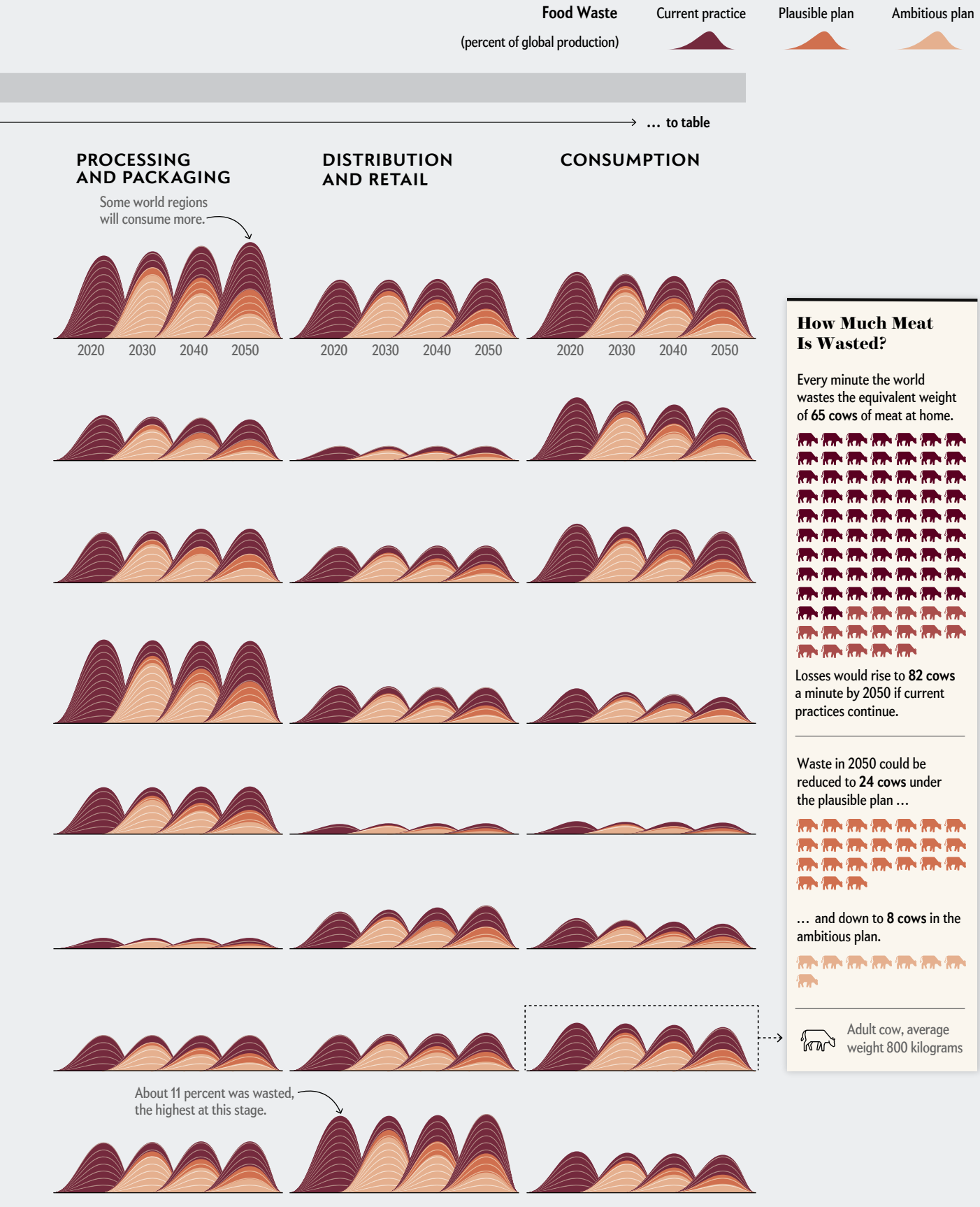
Food Waste
(percent of global production)
Current practice
Plausible plan
Ambitious plan
… to table
PROCESSING AND PACKAGING
DISTRIBUTION AND RETAIL
CONSUMPTION
Some world regions will consume more.
2020
2030
2040
2050
About 11 percent was wasted, the highest at this stage.
How Much Meat Is Wasted?
Every minute the world wastes the equivalent weight of 65 cows of meat at home.
Losses would rise to 82 cows a minute by 2050 if current practices continue.
Waste in 2050 could be reduced to 24 cows under the plausible plan …
… and down to 8 cows in the ambitious plan.
Adult cow, average weight 800 kilograms

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Carbon Emissions Avoided

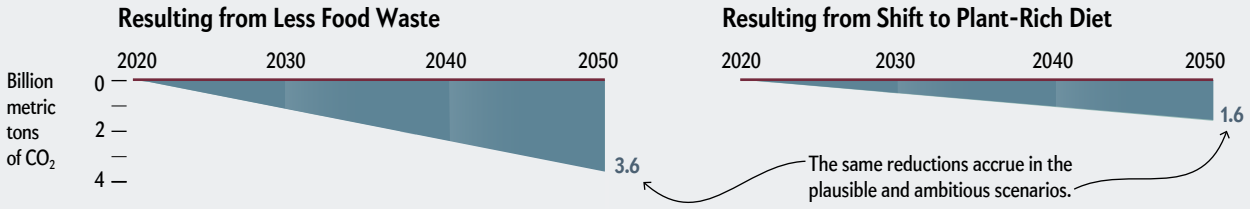
If global population, consumption per person and waste along the supply chain continue according to recent trends, the world will emit huge amounts of greenhouse gases related to food. It will also have to clear more land to cultivate, which creates additional emissions and shrinks forests and grasslands that could absorb atmospheric carbon dioxide. Changes under the plausible and ambitious scenarios would greatly reduce emissions.

Annual CO_2 Emissions
- Current practices continue
- Plausible scenario
- Ambitious scenario

EMISSIONS REDUCTIONS BECAUSE OF ...

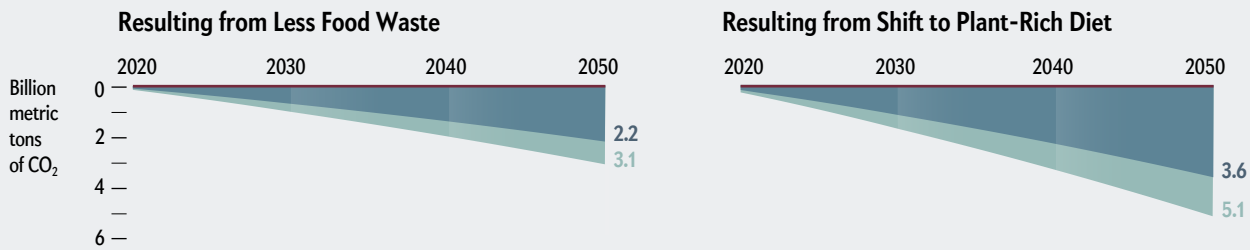
... LAND CONVERSION AVOIDED

Compared with current practices continuing through 2050, less food waste and shifting to a plant-rich diet in the plausible and ambitious scenarios would allow the world to produce enough food on current cropland. Not clearing more land would avoid billions of tons of carbon emissions.

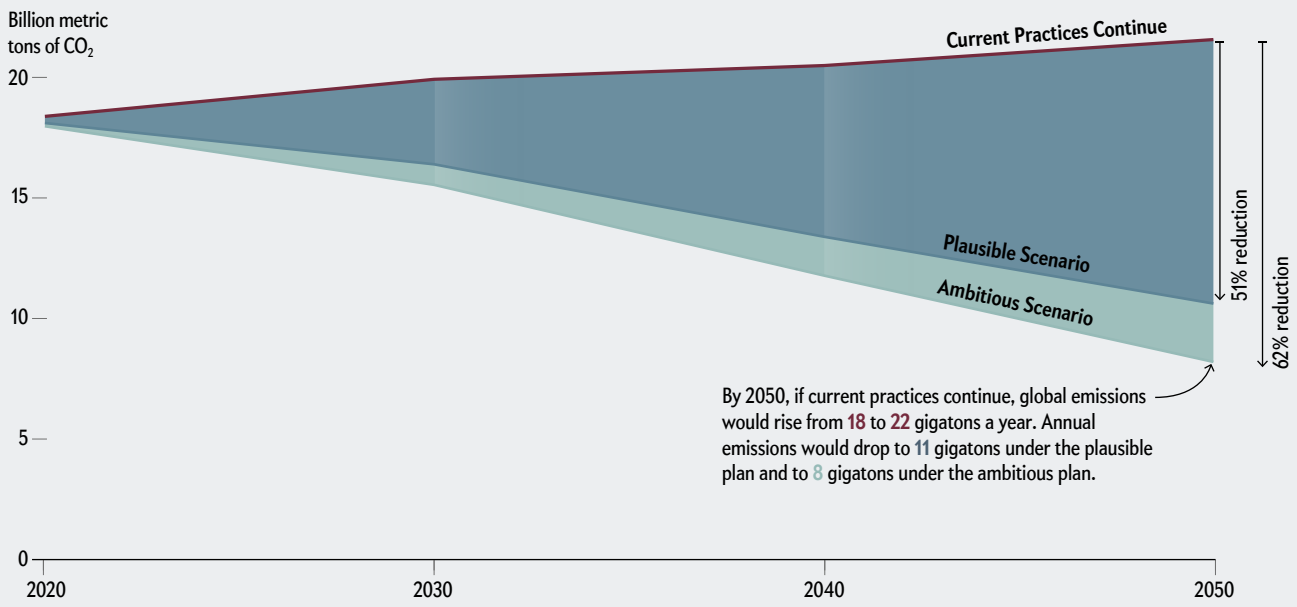


... BETTER AGRICULTURAL PRODUCTION

Greater production efficiencies under regenerative farming practices in the plausible and ambitious scenarios would further reduce emissions related to less food waste and a shift to a plant-rich diet.



TOTAL CO_2 EMISSIONS REDUCTIONS FROM CHANGES ABOVE (ANNUAL)



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Continued from page 66

of foods such as grains, vegetables, fish, meat and dairy have very different environmental footprints. On average, growing and harvesting one kilogram of tomatoes creates about 0.35 kilogram of carbon dioxide emissions. Producing the same amount of beef creates an average of 36 kilograms of emissions. With the entire supply chain taken into account, greenhouse gas emissions from plant-based commodities are 10 to 50 times lower than from most animal-based products.

Additionally, industrial agriculture has spread monocropping, excessive tillage, and widespread use of synthetic fertilizers and pesticides. These practices degrade soil and emit a vast amount of greenhouse gases. Staples are still destroyed in the field by pests and disease and can rot in storage. Livestock consumption of grasses and feed adds further emissions.

Agroecological pest-management practices, such as planting different crops together, and smarter crop rotation can suppress pests and weeds, reducing these losses. Improved livestock-management practices, such as silvopasture, which integrates trees into foraging land, can improve the quality and quantity of animal-based products: more food from fewer hooves in the field and thus fewer resources used and fewer losses. And because regenerative farming practices—which can increase yield from 5 to 35 percent, restore soils and pull more carbon from the air—use compost and manure instead of artificial fertilizers, any food that fails to leave the farm gate can be recycled as natural fertilizer or can be converted by anaerobic digesters into biogas for energy on the farm. More farms need to convert to such practices. Restaurants across the U.S. are helping them through one interesting organization called Zero Foodprint, started by chef Anthony Myint, which takes a few cents added to patrons' bills to fund regenerative farms in the making.

SAVING THE THIRD BAG

IN LOW-INCOME COUNTRIES, most food is lost before ever getting to market. Improving education and professional training for farmers and producers there, along with innovative technologies, can minimize waste. India's state of Jharkhand, for example, has installed solar-powered refrigeration units that allow farmers who produce vegetables, fruits and other perishables to store their products without sacrificing quality—a project led by the United Nations Development Program and the Global Environment Facility. In Africa, the Consortium of International Agricultural Research Centers has expanded training that will help local farmers grow more food under conditions being created by climate change, using crops that better tolerate drought and no-till farming to protect withering soil.

In high- and medium-income countries, most waste occurs at the end of the supply chain—markets and households. There consumers have a tremendous amount of power to prevent waste. A good first step is to reflect on what and how much we are buying. This begins with conscious decisions to purchase what we intend to eat and to eat what we purchase. Rather than overstocking on perishables and other products, buying appropriate quantities of food reduces waste. If too much is cooked for the dinner table, properly storing leftovers reduces spoilage, or they can be shared with neighbors, building stronger community ties.

Broader cultural shifts are also required. The "inglorious fruits and vegetables" campaign launched by the French supermarket chain Intermarché in 2014 aimed to avoid waste by changing cultural attitudes toward "imperfect" foods. Markets tend to procure only fruits and vegetables that meet an idealized cultural perception of shape and color. Imperfect produce that does not match these false traits accounts for up to 40 percent of edible fruits and vegetables being discarded before they leave the farm gate. Instead Intermarché sells these fruits and vegetables in special aisles and runs a national marketing campaign glorifying the inglorious. Other retailers are going even further: All the shelves at Danish supermarket WeFood are stocked with products that would have gone to a landfill. Pittsburgh-based 412 Food Rescue distributes nutritious food that was destined for landfills because of imperfections, limited freshness (such as day-old bread) and unclear labeling to communities in need—for free.

Wholesalers, retailers and restaurants can play a significant role in shrinking the waste piles. They can demand that suppliers use more food from local regenerative farms. Ensuring that food items are sold with clear, standardized "sell by/use by" labels helps store managers know when to mark down items, and it helps consumers know when and when not to dispose of food. Restaurant owners can offer different portion sizes and fewer menu items and can encourage patrons to take leftovers home.

Governments and companies that offer food services to employees can jump in, too. U.S. federal government cafeterias serve more than two million people; imagine if the kitchen managers chose to offer plant-rich fare made from perfectly imperfect produce procured from regenerative suppliers. Google is already doing more of that in its cafeterias today.

No matter how conscientious we all are, some food will inevitably be lost across the supply chain. Anaerobic digesters and composting are better ways of disposal than dumping food in landfills because they create soil or generate electricity. Nine states across the U.S. now have laws requiring that organic waste be diverted from landfills to avoid potent methane emissions. The latest Project Drawdown analysis shows that implementing these solutions globally can reduce greenhouse gas emissions by around 14 billion metric tons over the next 30 years.

The real magic happens when a variety of solutions are adopted in parallel and sustained over time. The decisions people make as farmers, executives, grocers, chefs and consumers can prevent enough food loss to feed the world through 2050 without converting any more land. That means together we can eliminate hunger and support a healthier global population. And there would still be enough cropland available to grow plants for organic materials such as bioplastics, insulation and biofuels.

Revamping the food chain and adjusting eating habits will not happen overnight. Nor should we expect to immediately become perfect, regeneratively minded, plant-rich connoisseurs who are fastidious about our purchases and what we waste. Our most fundamental task is to be conscientious about the choices we make—to try to be "solutionists" as much as we can. Together we can save that third bag of groceries. SA

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4

DIVERSE WORK SPACE

74 How Diversity Works

78 Women's Work

84 The Brilliance Trap

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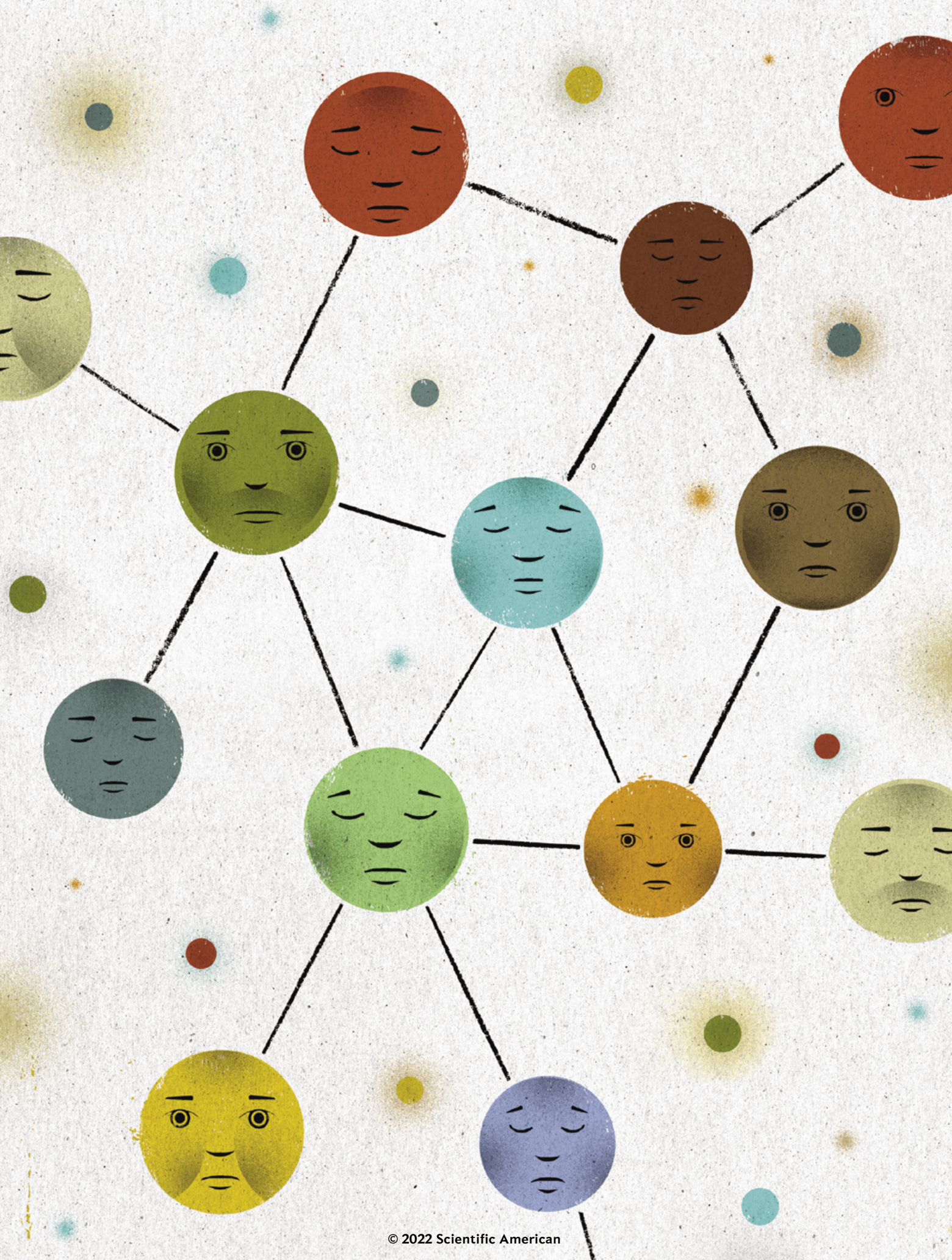

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How Diversity Works

Being around people who are different from us makes us more creative, more diligent and harder-working

By Katherine W. Phillips

THE FIRST THING TO ACKNOWLEDGE ABOUT DIVERSITY IS THAT IT CAN BE DIFFICULT. In the U.S., where the dialogue of inclusion is relatively advanced, even the mention of the word "diversity" can lead to anxiety and conflict. Supreme Court justices disagree on the virtues of diversity and the means for achieving it. Corporations spend billions of dollars to attract and manage diversity both internally and externally, yet they still face discrimination lawsuits, and the leadership ranks of the business world remain predominantly white and male.

It is reasonable to ask what good diversity does us. Diversity of *expertise* confers benefits that are obvious—you would not think of building a new car without engineers, designers and quality-control experts—but what about social diversity? What good comes from diversity of race, ethnicity, gender and sexual orientation? Research has shown that social diversity in a group can cause discomfort, rougher interactions, a lack of trust, greater perceived interpersonal conflict, lower communication, less cohesion, more concern about disrespect, and other problems. So what is the upside?

The fact is that if you want to build teams or organizations capable of innovating, you need diversity. Diversity enhances creativity. It encourages the search for novel information and perspectives, leading to better decision-making and problem-

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solving. Diversity can improve the bottom line of companies and lead to unfettered discoveries and breakthrough innovations. Even simply being exposed to diversity can change the way you think. This is not just wishful thinking: it is the conclusion I draw from decades of research from organizational scientists, psychologists, sociologists, economists and demographers.

INFORMATION AND INNOVATION

THE KEY TO UNDERSTANDING the positive influence of diversity is the concept of informational diversity. When people are brought together to solve problems in groups, they bring different information, opinions and perspectives. This makes obvious sense when we talk about diversity of disciplinary backgrounds—think again of the interdisciplinary team building a car. The same logic applies to social diversity. People who are different from one another in race, gender and other dimensions bring unique information and experiences to bear on the task at hand. A male and a female engineer might have perspectives as different from each other as an engineer and a physicist—and that is a good thing.

When people are brought together to solve problems in groups, they bring different information, opinions and perspectives.

Research on large, innovative organizations has shown repeatedly that this is the case. For example, business professors Cristian Dezsö of the University of Maryland and David Gaddis Ross of the University of Florida studied the effect of gender diversity on the top firms in Standard & Poor's Composite 1500 list, a group designed to reflect the overall U.S. equity market. First, they examined the size and gender composition of firms' top management teams from 1992 through 2006. Then they looked at the financial performance of the firms. In their words, they found that, on average, "female representation in top management leads to an increase of $42 million in firm value." They also measured the firms' "innovation intensity" through the ratio of research and development expenses to assets. They found that companies that prioritized innovation saw greater financial gains when women were part of the top leadership ranks.

Racial diversity can deliver the same kinds of benefits. In a study conducted in 2003, Orlando Richard, now at the University of Massachusetts Amherst, and his colleagues surveyed executives at 177 national banks in the U.S., then put together a database comparing financial performance, racial diversity and the emphasis the bank presidents put on innovation. For innovation-focused banks, increases in racial diversity were clearly related to enhanced financial performance.

Evidence for the benefits of diversity can be found well beyond the U.S. In August 2012 a team of researchers at the Credit Suisse Research Institute issued a report in which they examined 2,360 companies globally from 2005 to 2011, looking for a relation between gender diversity on corporate management boards and financial performance. Sure enough, the researchers found that companies with one or more women on the board delivered higher average returns on equity, lower gearing (that is, net debt to equity) and better average growth.

HOW DIVERSITY PROVOKES THOUGHT

LARGE DATA-SET STUDIES have an obvious limitation: they can show only that diversity is correlated with better performance, not that it causes better performance. Research on racial diversity in small groups, however, makes it possible to draw some causal conclusions. Again, the findings are clear: for groups that value innovation and new ideas, diversity helps.

In 2006 Margaret Neale of Stanford University, Gregory Northcraft of the University of Illinois at Urbana-Champaign and I set out to examine the impact of racial diversity on small decision-making groups in an experiment where sharing information was a requirement for success. Our subjects were undergraduate students taking business courses at the University of Illinois. We put together three-person groups—some consisting of all white members, others with two white members and one nonwhite member—and had them perform a murder mystery exercise. We made sure that all group members shared a common set of information, but we also gave each member important clues that only he or she knew. To find out who committed the murder, the group members would have to share all the information they collectively possessed during discussion. The groups with racial diversity significantly outperformed the groups with no racial diversity. Being with similar others leads us to think we all hold the same information and share the same perspective. This perspective, which stopped the all-white groups from effectively processing the information, is what hinders creativity and innovation.

Other researchers have found similar results. In 2004 Anthony Lising Antonio, a professor at the Stanford Graduate School of Education, collaborated with five colleagues at the University of California, Los Angeles, and other institutions to examine the influence of racial and opinion composition in small group discussions. More than 350 students from three universities participated in the study. Group members were asked to discuss a prevailing social issue (either child labor practices or the death penalty) for 15 minutes. The researchers wrote dissenting opinions and had both Black and white members deliver them to their groups. When a Black person presented a dissenting perspective to a group of white people, the perspective was perceived as more novel and led to broader thinking and consideration of alternatives than when a white person introduced *that same dissenting perspective*. The lesson: when we hear dissent from someone who is different from us, it provokes more thought than when it comes from someone who looks like us.

This effect is not limited to race. For example, in 2013 professors of management Denise Lewin Loyd of the University of Illinois, Cynthia Wang of Northwestern University, Robert B. Lount, Jr., of the Ohio State University and I asked 186 people

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whether they identified as a Democrat or a Republican, then had them read a murder mystery and decide who they thought committed the crime. Next, we asked the subjects to prepare for a meeting with another group member by writing an essay communicating their perspective. More important, in all cases, we told the participants that their partner disagreed with their opinion but that they would need to come to an agreement with the other person. Everyone was told to prepare to convince their meeting partner to come around to their side; half of the subjects, however, were told to prepare to make their case to a member of the opposing political party, and half were told to make their case to a member of their own party.

The result: Democrats who were told that a fellow Democrat disagreed with them prepared less well for the discussion than Democrats who were told that a Republican disagreed with them. Republicans showed the same pattern. When disagreement comes from a socially different person, we are prompted to work harder. Diversity jolts us into cognitive action in ways that homogeneity simply does not.

For this reason, diversity appears to lead to higher-quality scientific research. In 2014 Richard Freeman, an economics professor at Harvard University and director of the Science and Engineering Workforce Project at the National Bureau of Economic Research, along with Wei Huang, then a Harvard economics Ph.D. candidate, examined the ethnic identity of the authors of 1.5 million scientific papers written between 1985 and 2008 using Thomson Reuters's Web of Science, a comprehensive database of published research. They found that papers written by diverse groups receive more citations and have higher impact factors than papers written by people from the same ethnic group. Moreover, they found that stronger papers are associated with greater numbers of not only references but also author addresses—geographical diversity is a reflection of more intellectual diversity.

THE POWER OF ANTICIPATION

DIVERSITY IS NOT ONLY about bringing different perspectives to the table. Simply adding social diversity to a group makes people *believe* that differences of perspective might exist among them, and that belief makes people change their behavior.

Members of a homogeneous group rest somewhat assured that they will agree with one another, understand one another's perspectives and beliefs, and be able to easily come to a consensus. But when members of a group notice that they are socially different from one another, they change their expectations. They anticipate differences of opinion and perspective. They assume they will need to work harder to come to a consensus. This logic helps to explain both the upside and the downside of social diversity: people work harder in diverse environments both cognitively and socially. They might not like it, but the hard work can lead to better outcomes.

In a 2006 study of jury decision-making, social psychologist Samuel Sommers of Tufts University found that racially diverse groups exchanged a wider range of information during deliberation about a sexual assault case than all-white groups did. In collaboration with judges and jury administrators in a Michigan courtroom, Sommers conducted mock jury trials with a group of real selected jurors. Although the participants knew the mock jury was a court-sponsored experiment, they did not know that the true purpose of the research was to study the impact of racial diversity on jury decision-making.

Sommers composed the six-person juries with either all white jurors or four white and two Black jurors. As you might expect, the diverse juries were better at considering case facts, made fewer errors recalling relevant information and displayed a greater openness to discussing the role of race in the case. These improvements did not necessarily happen because the Black jurors brought new information to the group—they happened because white jurors changed their behavior in the presence of the Black jurors. In the presence of diversity, they were more diligent and open-minded.

GROUP EXERCISE

CONSIDER THE FOLLOWING SCENARIO: You are writing up a section of a paper for presentation at an upcoming conference. You are anticipating some disagreement and potential difficulty communicating because your collaborator is American and you are Chinese. Because of one social distinction, you may focus on other differences between yourself and that person, such as their culture, upbringing and experiences—differences that you would not expect from another Chinese collaborator. How do you prepare for the meeting? In all likelihood, you will work harder on explaining your rationale and anticipating alternatives than you would have otherwise.

This is how diversity works: by promoting hard work and creativity; by encouraging the consideration of alternatives even before any interpersonal interaction takes place. The pain associated with diversity can be thought of as the pain of exercise. You have to push yourself to grow your muscles. The pain, as the old saw goes, produces the gain. In just the same way, we need diversity—in teams, organizations and society as a whole—if we are to change, grow and innovate. SA

Katherine W. Phillips headed the Sanford C. Bernstein & Co. Center for Leadership and Ethics at Columbia University and was senior vice dean at Columbia Business School. Phillips passed away in 2020.

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Women's Work

As more women contribute to the economy, life gets better for everyone. Why are the barriers to opportunity so hard to change?

By Ana L. Revenga and Ana Maria Munoz Boudet

OVER THE PAST 60 YEARS WOMEN AND GIRLS in developing countries have made enormous progress. Plenty of data illuminates this trend. Take life expectancy at birth: it went from 54 years in 1960 to 72 years in 2008. During the same period, we experienced the world's fastest ever decline in fertility. These changes reflect gains for women on many fronts, including education, employment, access to reproductive health care and decision-making

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CLOSING THE GENDER GAP in employment would raise productivity by 12 percent in sub-Saharan Africa. Here a woman sews at a market in Swaziland.

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power, and it all happened much faster than it did in today's rich countries. It took India 44 years and Iran just 10 to reduce the number of children born to a woman from six to three; in the U.S., it took 123 years. Two thirds of all countries have reached gender parity in primary education enrollment, and in more than a third, more girls than boys are in school. In a striking reversal of historical patterns, women now represent the majority of university graduates. And more than half a billion women have joined the labor market since the 1980s, which means that today four in 10 workers globally are women.

Yet amid all this progress, the remaining gaps are stubbornly resistant to closure. Although women on the whole live longer than men, in parts of the world such as sub-Saharan Africa they are as likely to die in childbirth as northern European women were in the 19th century. Women still hold fewer positions of power in politics and business. And although many women work for pay, they do so under circumstances that weigh their talent, abilities and education differently from those of men.

These inequities are outrageous, and addressing them is both a rights issue and a fundamental objective of development. Just as we think development translates into less poverty and improved access to services for everyone, we also see it as a process of expanding freedoms. It promotes the ability to seize opportunities and decide on a life path. For us, pursuing gender equality—especially in women's access to income-generation opportunities—is a smart policy that itself leads to better development, not just the other way around.

Fully closing the well-being gap between the sexes requires specific, timely and intentional action. There are a few primary ways of doing this. First, remove the barriers that prevent women from having the same access as men to economic opportunities; this can generate higher productivity, and hence higher incomes, for all people. Second, increase women's education, health and overall agency, which results in better outcomes for both mothers and their children. Third, put more women in positions of power. Giving women a representative voice shifts policies and spending toward issues such as sanitation, schooling and health. If only implementing these changes were as easy as identifying them.

HEAVILY "FEMINIZED" SECTORS, such as food production and teaching, tend to have lower wages. In all sectors, men still make more than women who hold the same position, even after factoring in education and age. (*Top:* A coffee plantation in Costa Rica. *Bottom:* A girls' school in Pakistan.)

Edwin Remsberg/Getty Images (*top*); A. Majeed/Getty Images (*bottom*)

A PERSISTENT GAP

UNEQUAL ACCESS to economic opportunity is one of the major hurdles preventing progress. This is a problem in all countries, rich and poor, and in all industries, from farming to entrepreneurship.

The first roadblock is simply a barrier to entry: women must be able to access the economic space to participate in it. Although the female labor force has grown considerably in most parts of the world, a substantial participation gap is visible everywhere between men and women—56 percentage points in the Middle East and North Africa. Even if women can manage to break through that barrier, they are probably not competing on a level playing field. Female farmers have a more difficult time obtaining fertilizers, machinery and improved seed varieties, so their yields are often lower. Likewise, female entrepreneurs often have restricted access to capital and credit. Sometimes that is because they are less likely to own land or other assets required as collateral; other times it is because application procedures require a male co-signer or because banks assign female applicants a higher risk rating than male ones. This means that women-owned businesses are often less profitable, creating a chicken-and-egg cycle that is difficult to break. When these issues are corrected, overall productivity dramatically increases. A 2016 study showed that closing the gender gap in entrepreneurship would raise productivity and incomes by 12 percent in sub-Saharan Africa and 38 percent in the Middle East and North Africa.

Even in places such as the U.S. and Canada, where the labor-participation gap between sexes may fall below 15 percentage points, other factors hinder equality. Men and women tend to concentrate in different economic sectors, and it is easy to observe that women are more likely to work in education and social services, whereas men are more likely to work in construction

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and transport. But what is less noticeable is that women often occupy the lower-paid roles in whatever sector they are in. For instance, women are often teachers, nurses and clerical workers instead of principals, doctors and supervisors. Even as entrepreneurs, they tend to concentrate in traditionally female sectors such as food or clothing production.

Although we could discuss the preferences women (and men) might have for certain sectors, these patterns are not random. The problem is that those "preferences" reflect the influence of ideas and norms about "women's work" and "men's work," as well as other gendered attributes, such as the notion that women are better caregivers, whereas men are better suited for heavy physical work. The critical point is that heavily "feminized" sectors tend to have, on average, lower wages. And, of course, the gender difference in earnings is well known: Globally, a woman earns roughly 82 cents for each dollar a male worker earns. In Jordan and Côte D'Ivoire, the difference between incomes is about 40 percent. Rich countries are not exempt: New Zealand has a low of 9 percent; it is more than 30 percent in South Korea. But this difference reflects the different economic positions women hold. Even when you factor in characteristics such as education, sector and age that will make a female and male worker otherwise equal, the income gap persists. Female teachers in rural Pakistan, for instance, earn about 30 percent less than male teachers. Understanding—and addressing—the entrenched social norms behind these persistent gaps is key to closing them.

STUBBORN SOCIAL NORMS

ONE OF THE MAJOR CAUSES of lower earnings and productivity stems from constraints on women's time. Women devote far more of their days to care and household work than men, which in turn means that women have less time for paid work. Deep-rooted social norms drive the differences in "domestic" roles. What is most striking is that these norms, and hence patterns of time use, do not change even as women take up a larger share of market work. In Ghana, a wife still does more than 80 percent of the housework even when she brings home all the income. This imbalance is largely true elsewhere as well, including the U.S. Even in the most progressive places, this pattern reflects assumptions about the division of roles, identifying them as natural and biological instead of cultural. As a result, we all live as though this is just the way things are. You can see the effects everywhere in the workings of societies, households and markets. Look at school schedules, which are not consistent with a full-time employment day, or policies that allow mothers but not fathers to use sick days to care for an ill child. Breaking these patterns requires upending default expectations.

Unfortunately, policies used to address the time-constraint issue primarily work around these norms instead of confronting them head on. Although the results are promising, it's not a complete solution. The most popular example of this is providing increased access to child care services and improving parental-leave policies. As expected, the expansion of access to early child care and preschool services consistently leads to higher labor-market participation of women across all countries. Expanding child care accessibility (location, times of operation), affordability (direct and related costs) and capacity (removing waiting lists, including different ages of children) has a positive impact on the mother's labor engagement.

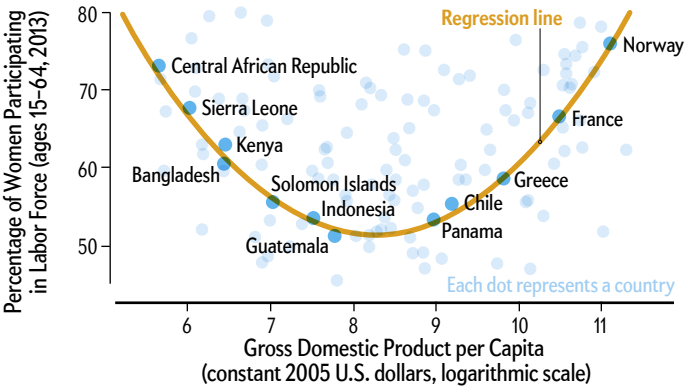
There is ample evidence that this policy change often alleviates constraints on working mothers' time. In the early 1990s Argentina embarked on a program to expand early childhood education. It resulted in the creation of 175,000 preschools over seven years. Researchers observed labor patterns as the program expanded and found a positive impact of between 7 and 14 percentage points in mothers' employment. Most notably, these positive effects hold even when the preschool is only part-time.

But policies such as allocating more time to maternity leave—and adding paternity or parental leave to include fathers—have not always been as successful. In Germany, the expansion of maternity-leave regulation and coverage led more women to ultimately return to work with their prebirth employer. But when neighboring Austria shifted its maternity-leave duration in 1990 from one year to two years, it significantly reduced the percentage of women who returned to work at all.

Then there are the parental-leave programs in Scandinavian countries, which give fathers an incentive to share the load after the birth of a child. When they were first introduced, they were rarely used by men. But

A Labor U-Turn

Female labor force participation tends to be high during the early stages of economic development, when countries are poor and households cannot afford for anyone not to work. A large part of the work is agricultural production. As countries transform from rural societies into industrial or urbanized ones and more income starts flowing into homes, the types of jobs change, and more women stop working. As countries mature into modern service economies, women return to work but in different economic spaces.



Source: Ana María Muñoz Boudet (*data from World Development Indicators, World Bank*)

Graphic by Jen Christiansen

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In Ghana, a wife does more than 80 percent of the housework even when she brings home all the income. Such imbalances also exist in the U.S.

when such a policy in Sweden specifically gave fathers dedicated, nontransferable leave, it delivered positive results in terms of getting fathers to spend more time with their children. Studies have shown that these men remain very involved in parenting over time but slowly transition out of other domestic tasks as the leave effect ends.

Similarly, differences in human capital often affect women's career trajectories. The root of the problem is not a difference in ability or capacity between the sexes—it is discrepancies in how we invest in and value women as workers. In developing countries, these differences appear as access to and completion of education; in more developed countries, where educational attainment is higher and both men and women attend university in large numbers, gender differences show up in fields of study. In the U.S., for example, women represent less than 35 percent of the degrees in the science and technical fields even though they account for almost 60 percent of college graduates.

When it comes to bridging human capital between men and women, governments must make investments beyond traditional education to include training, apprenticeships and other labor policies. Young job seekers are an important target of these policies. One notable example is the series of Jóvenes (youth) programs implemented across Latin America in the early 2000s, which encompassed a combination of training, internships and incentives to employers with a goal of breaking biases in hiring young workers. Across the board, these programs increased the probability of young women becoming employed and boosted their earnings.

But efforts to translate the lessons from the Jóvenes programs to other settings have had uneven results. An evaluation of a similar vocational-training program in Malawi found that family obligations limited female participation. The Jordan New Opportunities for Women pilot involved more than 1,000 young women from community colleges. Demand for the program was extremely high: many of these women successfully completed the vocational training, and half of those graduates found jobs thanks to wage-subsidy vouchers provided for employers. But the effects were short-lived, and no changes were found in employment or earnings. Here again, it appears that social norms and employers' views about women heavily impeded successful replication of the initiative.

The third driver of gender inequality in economic opportunities is what we would typically call discrimination: the differential treatment of women by markets and institutions. When few women are employed in a certain sector, employers may hold biased beliefs about their qualifications. They may be reluctant to hire women because they associate extra costs, such as maternity leave, with female employees, or they may assume that women are not the primary breadwinners and therefore lack motivation. A number of studies that compare the reactions of employers with otherwise identical female and male CVs found substantial evidence of gender discrimination when it comes to recruitment and hiring. Moreover, access to jobs often involves gendered networks: when women are poorly represented in an occupation, they are less likely to become aware of opportunities and may be unable to find mentors. In many countries, gender-specific job advertisements and gender-biased selection criteria and recruitment are still common. In a surprisingly high number of countries in the Women, Business and the Law database, employers are not prohibited from asking job applicants about family status and family planning.

Government institutions can also treat men and women differently, often in ways that play against women's interests. For example, in 45 percent of countries, women cannot work the same jobs or hours as men. Many former Soviet countries are

WOMEN perform the lion's share of household duties, even in the most progressive countries. Here a woman prepares food on a farm in Bangladesh.

Thomas Trutschel/Getty Images

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particularly restrictive. In Russia, there are 100 occupations currently forbidden to women, including steelworker, firefighter and oil-well worker. Other countries require women to get male permission to accept jobs, open bank accounts or operate businesses. In Chile, husbands have the sole right to administer marital property, regardless of whose income or savings was used to purchase the property. In Pakistan, a married woman cannot register a business in the same way as a married man. In Mongolia, many women cannot work at night. In Yemen, a husband can object to a wife's employment.

These three sets of differences between men and women—in responsibilities for care and housework, in human capital investments, and in treatment by markets and institutions—not only get in the way of equitable economic opportunities but often do so in ways that reinforce one another. Devoting much more time to care and housework may encourage women to self-select occupations that offer greater flexibility in hours but trap them into lower pay. This is especially true if formal employment options come with restrictions on part-time work, as is the case in many developing countries. Preemptively knowing it will be hard to get a job—and fit in—in a male-dominated field such as engineering or construction may discourage girls and young women from acquiring the education and skills necessary to pursue those opportunities. And repeated experiences of discrimination in job applications and hiring may push women toward informal self-employment or discourage participation in the labor market altogether, which starts the cycle of inequality all over again.

FINE-TUNING THE SOLUTIONS

WHY, IF WE HAVE been able to clearly identify the roots of the gender gaps in economic empowerment, does change remain so elusive? For starters, the multiplicity of factors requires many actions coordinated toward the same goal. And given that the nature, structure and functioning of markets, institutions and norms vary widely across countries, a one-size-fits-all policy approach is impossible. As we have shown, policies that were successful in one context may face significant resistance in another.

Still, a few general principles have proved critical for successful policies. To be effective, policies and interventions need to target the multiple underlying factors that drive gender differences in access to economic opportunities. That is, they need to directly address the constraints on women's time that arise from gendered social norms about care and housework, not circumnavigate them. To increase productivity, they must fill the gaps in information, skills and access to professional networks that constrain the opportunities of female wage workers, farmers and entrepreneurs. And they need to help build a more level playing field in markets and institutions by targeting discriminatory preferences.

One such promising example of a dynamic intervention hits many of those targets. The Empowerment and Livelihood for Adolescents program (ELA) implemented in Uganda by the nongovernmental organization Building Resources Across Communities provided young women aged 14 through 20 with life skills and vocational training at "girls' clubs" where a mentor was present to lead activities. The clubs also served as a safe space in which adolescent girls could meet, socialize and recreate. A quarter of the girls in the 100 communities selected for the evaluation participated in the program, and the results were impressive. Girls in ELA communities were 72 percent more likely to be engaged in an income-generating activity four years later. But most important, the program shifted the girls' attitudes and aspirations. For example, the participants were more likely to believe that women should earn money for their families and less likely to be worried about finding a good job in adulthood. Strikingly, those shifts helped teen pregnancy rates fall by 34 percent, and early entry into marriage or cohabitation dropped by 62 percent.

Policy makers, too, must learn from their own successes and failures and those of others. To achieve that, they must be able to clearly articulate both what goes into the policy and its expected impact. These initiatives also need to be piloted and properly evaluated before taken to scale. Too many interventions designed to support gender equality rely only on good intentions and intuitions. Whereas some might deliver in terms of outputs—say, the number of women who received training from a vocational program—many fail to deliver the expected final outcome, which in this case means getting more women to enter (and stay in) the labor market.

Policies and programs that show the greatest potential should be expanded and intensified. They must not be stopped even once the desired objective seems to be achieved—long-term follow-through is especially critical when tracking social changes as well as logistical ones. Progress requires constant, concerted and coordinated action to make markets, institutions and societies as a whole work more fairly for women, and changing the long-standing norms about women's and men's roles both at home and at work is a tall order. Resources for gender-specific interventions compete with other urgent development priorities, such as food security and poverty reduction. And goals like those can have no specific effects on closing gender gaps. That is why it is essential to rely on tested and proven tactics instead of leaning too heavily on advocacy and good intentions.

Greater gender equality is achievable with a combination of political will and evidence-based policies. Women and men of the future all stand to benefit from a more equitable society. SA

UNEQUAL SEATING

Only **26** women hold the office of head of state or government around the world.

A mere **26%** of parliamentary seats are occupied by women globally.

Rwanda has the highest female representation: **61%** of the 80 seats in the country's lower house are held by women.

Sources: Facts and Figures: Leadership and Political Participation, U.N. Women www.unwomen.org/en/what-we-do/leadership-and-political-participation/facts-and-figures (*heads of state or government*); Women in National Parliaments: Situation as of March 1, 2022, Inter-Parliamentary Union data.ipu.org/women-averages (*parliamentary seats*)

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The Brilliance Trap

How a misplaced emphasis on genius subtly discourages women and Black people from entering certain academic fields

By Andrei Cimpian and Sarah-Jane Leslie

Illustrations by Allison Seiffer

IN THE 1980S PHILOSOPHERS WOULD SOMETIMES SPEAK OF "THE BEAM"—A METAPHORICAL spotlight of intellectual brilliance that could illuminate even the most complex philosophical conundrums. Only some lucky philosophers were ever born with the Beam, and their work represented the gold standard of the field. Anyone who lacked the Beam was forever condemned to trail behind them intellectually.

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One of us (Leslie) would share this sort of story whenever we would see each other at conferences. The two of us were trained in different disciplines (Leslie in philosophy and Cimpian in psychology), but we studied similar topics, so we would get together regularly to catch up on research and talk about our experiences as members of our respective fields. Psychology and philosophy are quite similar in their substance (in fact, psychology was a branch of philosophy until the mid-1800s), but the stories we told painted a picture of two fields with vastly different views on what is important for success. Much more so than psychologists, philosophers value a certain kind of person—the brilliant superstar with an exceptional mind. Psychologists, in contrast, are relatively more likely to believe that the leading lights in their field grew to achieve their positions through hard work and experience.

At first, we viewed philosophy's obsession with brilliance as a quirk—a little strange but innocuous. Other things seemed to present bigger problems in Leslie's field, such as its inability to attract women and minorities. Despite sustained attention to issues of underrepresentation in recent years and some efforts to alleviate them, women still accounted for fewer than 30 percent of the doctoral degrees granted in philosophy in 2015, and Black people made up only 1 percent of philosophy Ph.D.s. The field of psychology, in contrast, has been quite successful in attracting and retaining women (more than 70 percent of newly minted Ph.D.s), and Black people held 6 percent of its 2015 doctoral degrees. Admittedly, these figures still fall short of their share of the general population, but they are nonetheless six times the ratio in philosophy.

We could not wrap our minds around the discrepancy. Our fields have so much in common—both philosophers and psychologists ask questions about how people perceive and understand the world, how they decide between right and wrong, how they learn and use language, and so on. Even the few salient differences—such as psychologists' greater use of statistics and randomized experiments—are becoming blurred nowadays with the huge increase in the popularity of experimental philosophy, in which philosophers conduct surveys and experiments to explore different perspectives on morality, for example. How could two such closely related fields be so vastly different in membership?

A BRILLIANT IDEA

THE CLOSEST THING either of us has ever had to a eureka moment came some years ago when we connected two threads running through the anecdotes we had been sharing. We were having dinner with a group of philosophers and psychologists at a conference, and the conversation happened to turn, in quick succession, from philosophers' infatuation with brilliance to the gender gap in their field. This chance juxtaposition brought to mind for us a connection we had never considered before: maybe the premium that philosophers place on brilliance is actually the reason so few of their colleagues are women or minorities. We did not discount the benefits of brilliance. Rather we wondered whether genius was more easily overlooked in women and Black people. Could it be that insistence on the need for a keen intellect in a particular field was tantamount to hanging a "Keep Out" sign to discourage any newcomers who did not resemble that field's current members?

On the surface, an emphasis on brilliance does not favor one group over another; cognitive ability is not tied to gender or race. Philosophers seek a certain quality of mind—regardless of whose mind it is. This seemingly logical preference quickly becomes problematic, however, in light of certain shared societal notions that incorrectly associate superior intellect with some groups—for example, white males—more than others.

Even among the academics present that night, one of the views expressed was that men and women just thought differently. Women were alleged to be more practical and anchored in reality, whereas men were more willing to engage in the kind of counterfactual, abstract reasoning that is viewed as a sign of philosophical brilliance. We started to wonder whether such stereotypes, which amount to equating brilliance with men, might well dissuade women from entering a field that holds this quality in high esteem. Moreover, current members of such a field might themselves hold different expectations about the prospects of men and women and might evaluate and encourage them differently as a result. The same logic extends to race: our country has a long history of portraying Black people as intellectually inferior, which is particularly likely to affect participation in a field that focuses so single-mindedly on the quality of one's intellect. Considering these stereotyped attitudes, which are unsupported by science, philosophy's fascination with brilliance may have a real impact on its diversity.

Later that night the two of us talked about our insight. We speculated about whether its implications extend beyond our home disciplines. Talk of brilliance is common in academia and—it seemed to us—quite common in fields that have similar issues with diversity, such as science, technology, engineering and mathematics. Might our anecdotal comparison of philosophy and psychology have something new to say about the underrepresentation of women and minorities in these disciplines?

The more we thought about it, the more we realized that our brilliance hypothesis might also explain some of the variability in gender and race gaps *among* different scientific fields. For example, women make up nearly 50 percent of doctoral degrees in biochemistry but just slightly more than 30 percent of Ph.D.s in organic chemistry. The difference cannot easily be explained by the content of the fields, in which there is considerable overlap, or by their history—biochemistry emerged from organic chemistry at about the same

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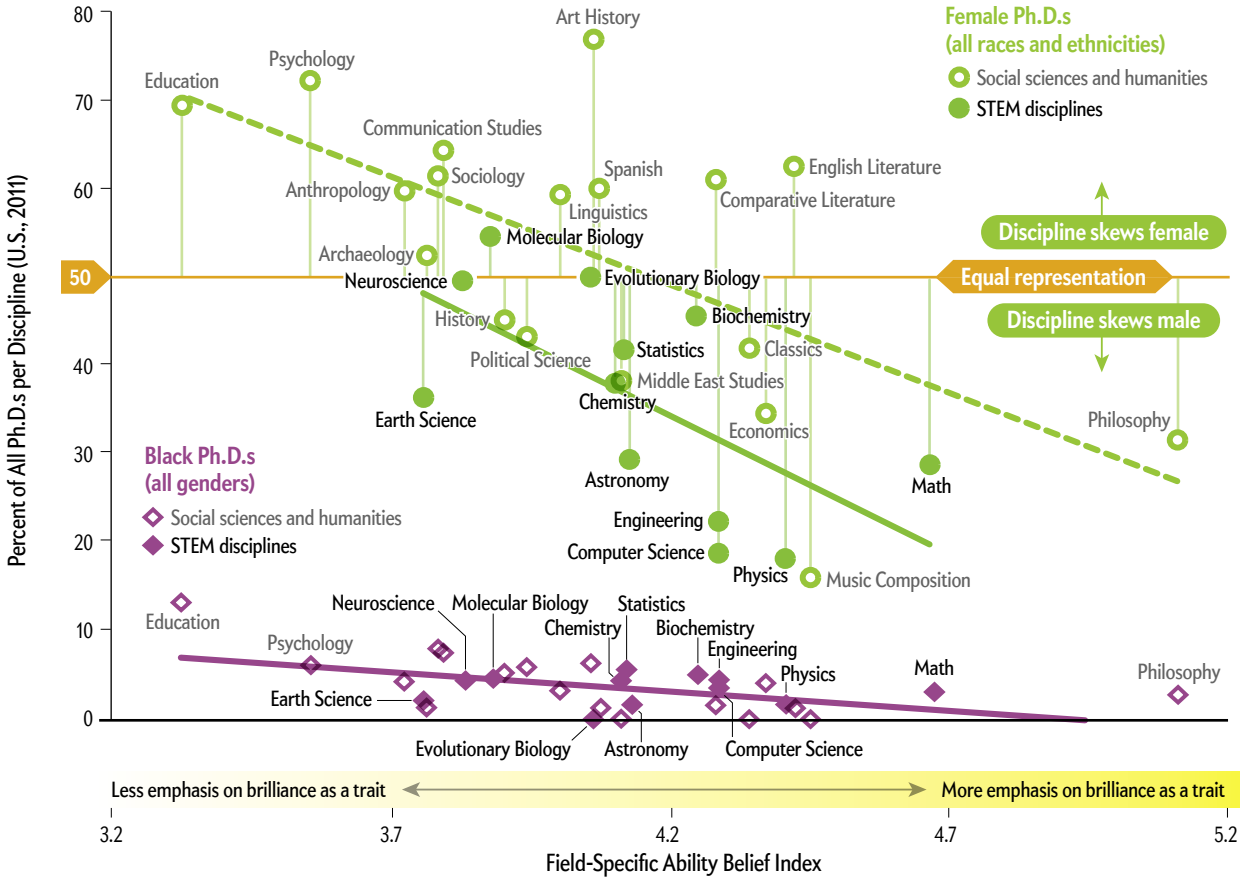
How Stereotypes about Genius Affect Women and Black People in Academia

A survey of almost 2,000 professionals in 30 academic fields determined how strongly they believed that the trait of brilliance, as measured by a so-called field-specific ability belief index, mattered for success in their discipline. Fields with higher scores, such as physics, math and philosophy, awarded fewer advanced degrees to women and Black people compared with neuroscience and psychology, which scored lower. The results suggest that many fields implicitly equate brilliance with white males.



Source: "Expectations of Brilliance Underlie Gender Distributions across Academic Disciplines," by Sarah-Jane Leslie et al., in *Science*, Vol. 347; January 16, 2015

Graphic by Jen Christiansen

time psychology separated out of philosophy as an independent discipline. We wondered whether the demographic differences between such sibling subjects, as well as more generally among scientific fields, could be explained in part by the extent to which they emphasize exceptional intellectual talent as the key to success.

SUCCESSFUL MINDSETS

OUR EARLY CONJECTURES quickly reminded us of the rich body of work developed by psychologist Carol S. Dweck of Stanford University. Dweck and her colleagues have shown that one's beliefs about ability matter greatly for one's ultimate success. A person who sees talent as a stable trait (a "fixed mindset" in Dweck's terminology) is motivated to show off this aptitude and avoid mistakes, which presumably reflect the limits of that gift. In contrast, a person who adopts a "growth mindset" sees his or her current capacity as a work in progress. In other words, ability is a malleable quantity that can usually be increased with more effort and better strategies. For a person with a growth mindset, mistakes are not an indictment but rather a valuable signal highlighting which of their skills are in need of work.

Although Dweck initially studied mindsets in individuals, she and Mary Murphy, now at Indiana University Bloomington, suggested in 2010 that organized groups of people, such as companies and clubs, may also hold these sorts of views. We took that idea a step further and considered whether they might permeate entire disciplines as well. The fascination with brilliance in philosophy and other areas could conceivably create an atmosphere in which displays of intellectual prowess are rewarded and imperfections are to be

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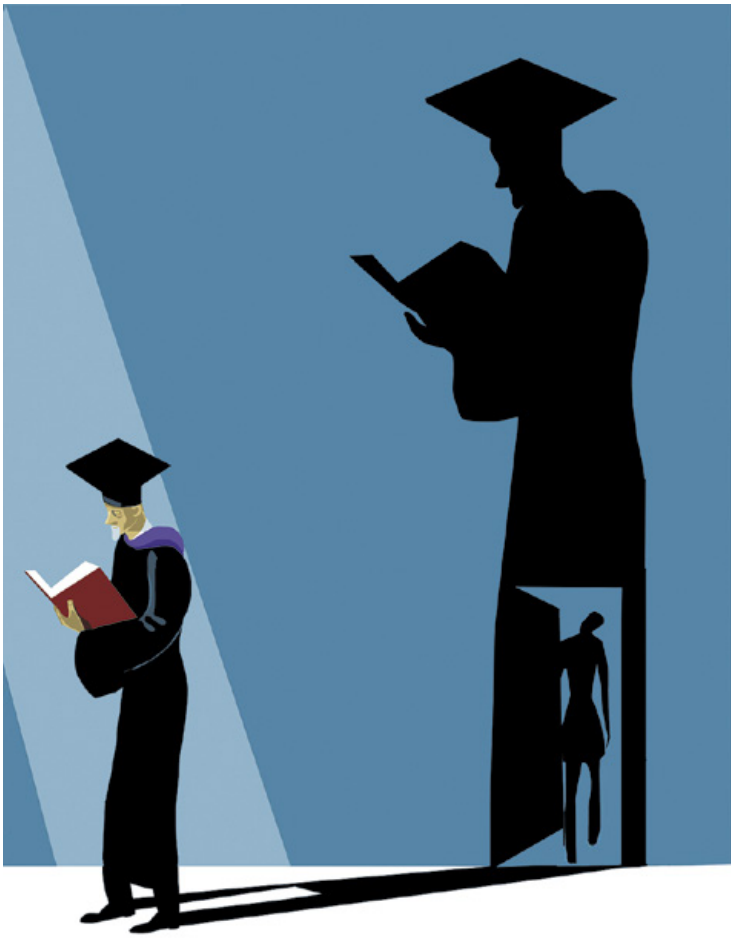

avoided at all costs. In combination with the stereotypes suggesting that genius is unevenly distributed across groups, such a field-wide perspective could easily turn toxic for members of stereotyped groups, such as women or Black people. After all, it is easy to "see" imperfections and inadequacies in those people who are expected to have them.

Several long phone conversations later, we had a tentative plan for putting our ideas to the test. We would contact academic professionals from across a wide range of disciplines and ask them whether they thought that some form of exceptional intellectual talent was necessary for success in their field. We would then look up statistics on the gender and racial/ethnic composition of the people obtaining Ph.D.s in these disciplines, which the National Science Foundation freely supplies on its Web site. If our hunch was correct, we should see that those disciplines that place more value on brilliance tend to have fewer female and Black Ph.D.s. This pattern should hold not just at the macro level—when comparing the hard sciences, for example, with the social sciences and the humanities—but also *within* these broad domains for disciplines as similar as philosophy and psychology.

More than a year and thousands of e-mailed surveys later, we and our collaborators Meredith Meyer of Otterbein University in Ohio and Edward Freeland of Princeton University finally had an answer to some of our questions. Equal parts relieved and exhilarated, we saw that the answers received from almost 2,000 academics across 30 fields matched the distribution of Ph.D.s in the way we had expected. Fields that placed more value on brilliance also conferred fewer Ph.D.s on women and Black candidates. The greater the emphasis on this single fixed trait, the fewer doctoral degrees were awarded to either of these groups. The proportion of female and Black Ph.D.s in psychology, for example, was higher than the parallel proportions for philosophy, math or physics.

Next, we separated the responses in the physical and biological sciences from those in the humanities and social sciences. Analyses of these subgroups indicated that a stronger emphasis on brilliance correlated with fewer female and Black Ph.D.s regardless of whether we compared physics with biology or philosophy with sociology. It seemed that we had stumbled onto an explanation that was general enough to describe the representation of multiple stereotyped groups in fields across the entire academic spectrum.

ALTERNATIVE IDEAS

OUR EXCITEMENT about these data aside, all we had really shown at this point was a correlation between the presumed desirability of a fixed trait—brilliance—and a dearth of women or Black people in a given field. We had not yet demonstrated cause and effect. Certainly many other plausible explanations for the gender imbalances have been proffered over the years—from a heavier workload that favored single men and those with wives who did not work outside the home to a supposed female preference for working with living organisms, as opposed to inanimate objects. We needed to determine whether we were bringing something new to the table—perhaps our explanation reduced to one that had been previously offered.

We carefully examined the most common alternatives. For instance, did our brilliance measure simply track differences between fields in their reliance on math? We looked at the math portion of incoming students' Graduate Record Examinations (GREs) as a proxy. Beliefs about brilliance still predicted women's representation above and beyond those scores. Similarly, we found no support for the common view that women are underrepresented in "high-powered fields" because they prefer a better work-family balance. We asked the academics in our sample how many hours they worked per week—both on- and off-campus. Taking into account these differences in workload did not, however, reduce the explanatory power of beliefs about brilliance; this single variable still predicted the magnitude of gender gaps across the 30 disciplines. We also considered the prevalent thought that women might be more interested in working with (and have a better intuitive understanding of) people, whereas

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men prefer inanimate systems. But an analysis of the many branches of philosophy, for example, that do in fact consider people—and are still dominated by men—basically blew that idea out of contention.

As often happens in research, this initial study made it clear to us how much we did *not* yet know about the phenomenon that we were investigating. For example, we realized it would be important to know if academics' beliefs about brilliance predict gender and race gaps at earlier points in students' educational trajectories. We were very interested in testing our idea at the bachelor's level, which is the gateway to students' later careers. Do field-level messages about the importance of brilliance relate to the majors that young women and Black students ultimately pursue?

The answer to this question is yes, as we reported in *PLOS ONE* in 2016 when we analyzed anonymous student evaluations of their college instructors on RateMyProfessors.com. We found that undergraduates were nearly twice as likely to describe male professors as "brilliant" or a "genius" compared with female professors. In contrast, they used such terms as "excellent" or "amazing" equally often for men and women on the popular Web site. We determined that the overall amount of talk about brilliance and genius in the student reviews (which is a proxy for a field's emphasis on these qualities) correlated closely with a lack of diversity in completed majors.

ORIGINS OF STEREOTYPES

FURTHER INVESTIGATION showed that nonacademics share similar notions of which fields require brilliance. Exposure to these ideas at home or school could discourage young members of stereotyped groups from pursuing certain careers (such as those in science or engineering) before they even set foot on a college campus.

At this point, we realized we needed to investigate the acquisition of these stereotypes. When do young people in our culture start thinking that some groups have more brilliant people in them? On the one hand, it could be that this stereotype emerges late in development, after sustained exposure to relevant cultural input (for example, media portrayals of brilliance and gender-biased expectations from parents, teachers, professors and peers). On the other hand, evidence from developmental psychology suggests that children are cultural sponges—incredibly sensitive to signals in their social environments. In fact, youngsters in the early elementary grades seem to have already absorbed the stereotypes that associate math with boys and reading with girls. From this perspective, we might expect that stereotypes about brilliance would also be acquired early in life.

To explore this idea, we asked hundreds of five-, six- and seven-year-old boys and girls many questions that measured whether they associated being "really, really smart" (our child-friendly translation of "brilliant") with their gender. The results, which we published in 2017 in *Science,* were consistent with the literature on the early acquisition of gender stereotypes yet were still shocking to us. Male and female five-year-olds showed no difference in their self-assessment. But by age six, girls were less likely than boys to think that members of their gender are "really, really smart."

Finding these stereotypes so early in childhood made us ask whether they might already begin to constrain boys' and girls' interests. We introduced another group of five-, six- and seven-year-olds to unfamiliar gamelike activities that we described as being "for children who are really, really smart." We then compared boys' and girls' interest in these activities at each age. The results revealed no gender differences at age five but significantly greater interest from boys at six and seven years of age—which is exactly where we saw the stereotypes emerge. In addition, the children's own stereotypes directly predicted their interest in these novel activities. The more a child associated brilliance with the opposite gender, the less interested he or she was in playing our games for "really, really smart children." This evidence suggests an early link between stereotypes about brilliance and children's aspirations. Over the rest of childhood development, this link may funnel many capable girls away from disciplines that our society perceives as being primarily for brilliant people.

The hard work of figuring out how best to put all this information to use—how to intervene—lies ahead of us. But a few suggestions follow pretty directly from the evidence we have so far. Minimizing talk of genius or brilliance with students and protégés may be a relatively easy and effective way of making one's field more welcoming for members of groups that are negatively stereotyped in this respect. Given current societal stereotypes, messages that portray this trait as singularly necessary may needlessly discourage talented members of stereotyped groups. The changes may need to go a little deeper than talk, however, and tackle some of the entrenched, systemic issues that accompany a field's fascination with brilliance. Refraining from mentioning the Beam will not help young women in philosophy if the rest of the field's practices continue to be implicitly anchored in the idea that brilliance is all that matters.

Another key takeaway is that we may need to intervene earlier than conventional wisdom suggests. Our developmental data indicate that some of the psychological processes that work against diversity in fields that value brilliance can be traced all the way back to elementary school. Waiting until college to step in and ensure that all young people have a fair shot at finding the careers that might suit them no longer seems like the best-timed intervention—we as a society would be wise to encourage a growth perspective, as opposed to a fixed-trait mindset, in young children as well. SA

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FRIENDLY FIELDS

Of the 17,505 doctorates awarded in science and engineering to women in the U.S. in 2015,

40%
were given in the life sciences

Of the 1,307 such doctorates granted to Black students, more than

40%
were in psychology and the social sciences

Source: *Doctorate Recipients from U.S. Universities: 2015,* National Center for Science and Engineering Statistics. National Science Foundation, 2017

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5

MAKING A MORE EQUITABLE WORLD

92 Social Resilience

98 Deepening Fault Lines

102 A Tapestry of Alternatives

112 The Power of Social Justice Movements

126 Intensified Inequity

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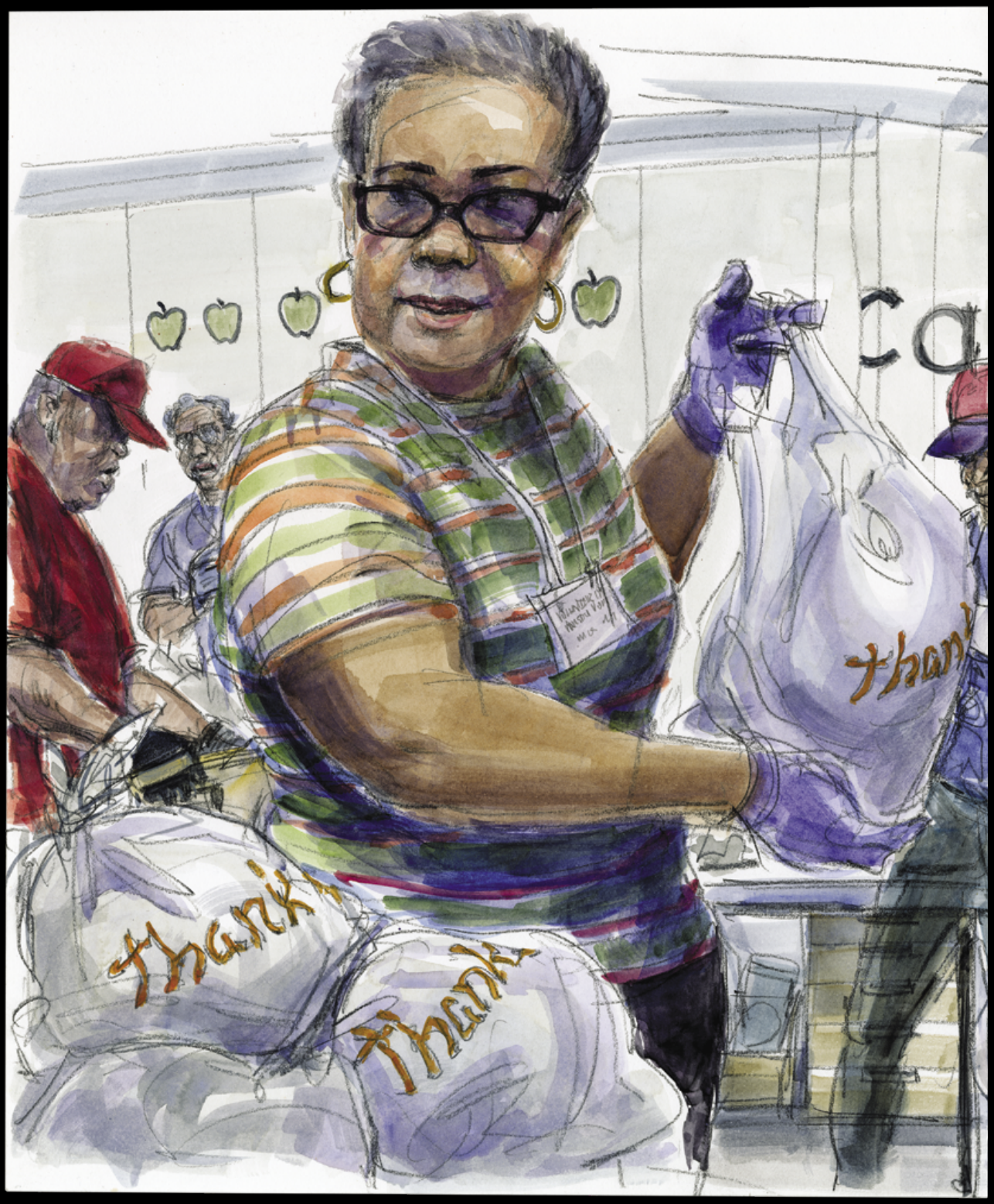

Social Resilience

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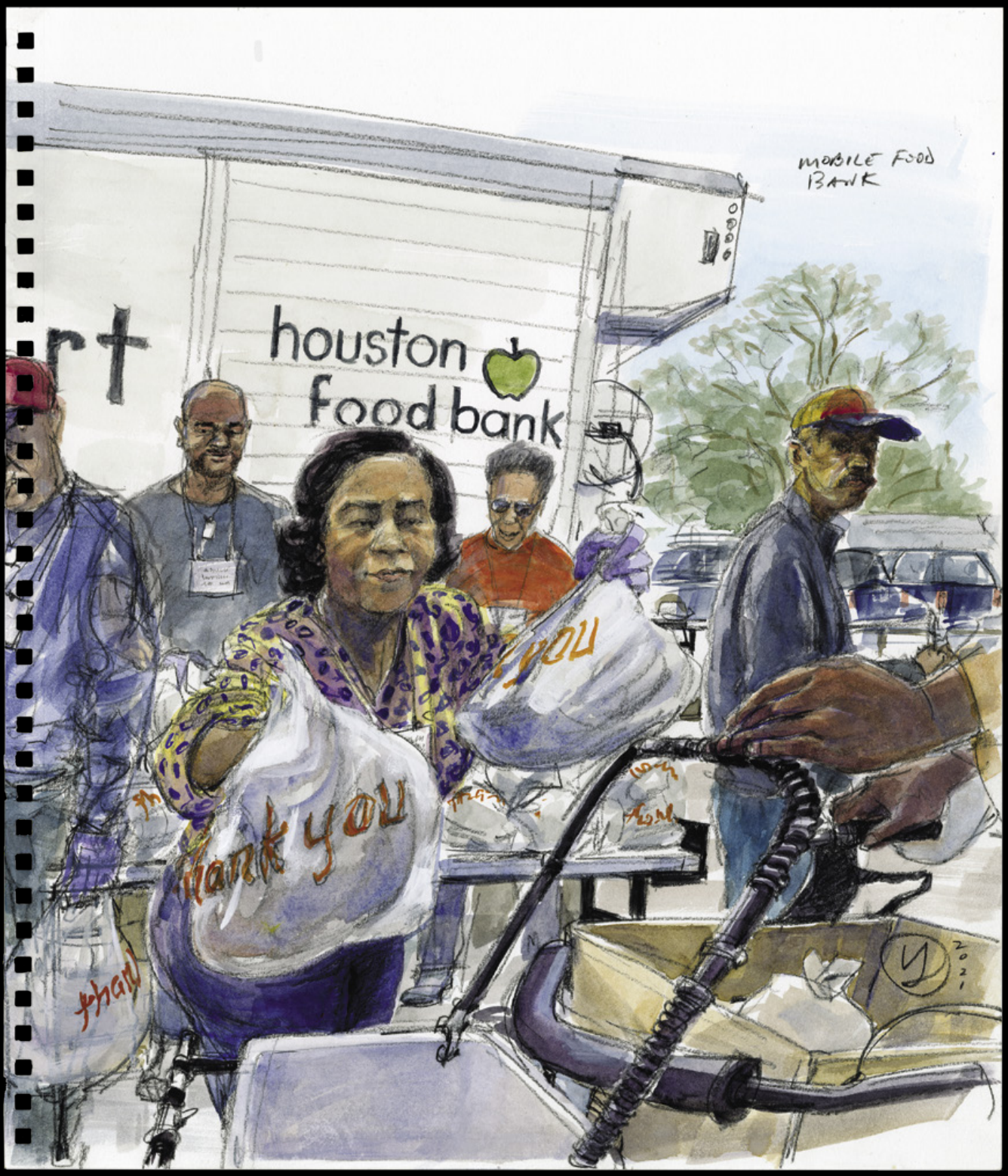

Underserved Black communities are often depicted as dysfunctional. Their resiliency has long been overlooked

By Nancy Averett | *Illustrations by Victor Juhasz*

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GOOD EVENING," JACQUELINE MATTIS SAYS, SETTING A GLASS of water down on a podium in the downtown branch of the Ann Arbor District Library in Michigan. The audience, mostly white and middle-aged, murmurs, "Good evening."

"Oh, no, no, no, no," Mattis says in a silky voice, holding up her hands in mock surprise. "I study religion. I study religion in the Black context, so let's start this again: Good evening!"

"Good evening!" the crowd exclaims in return.

Mattis nods, and when a man adds, "Amen!" her smile widens. "Better response," she says, pointing at him. "Better response!"

It is January 2020, and Mattis, a professor of psychology and dean of faculty at the School of Arts and Sciences at Rutgers in Newark, N.J., is discussing her latest research subject: the transformative power of love and altruism among urban-residing Black people in the U.S. She shares a story about an interview she did with a young woman—referred to by the pseudonym "Saniyka"—who showed up at a homeless encampment when she was 15, along with her four younger siblings. The adults there quickly became surrogate parents, sharing their tents, washing the children's clothes and providing food. They were persistent about education and an alternative vision of the future. By the time Saniyka was a high school senior, she had the highest grades in her class. Her tent-city parents saved money to fund her college application fees.

The audience is rapt during the story, as Mattis figured they would be. Although many appear surprised to hear that people with so little would give so much, she is not. Mattis grew up in majority-Black neighborhoods—first in Kingston, Jamaica, then in the Bronx—where people lacked access to the rights, resources and opportunities that were enjoyed by white residents nearby. Mattis had caring, hardworking neighbors who looked out for one another. Yet as a young adult, she noticed that the media often portrayed such places as rife with violence and dysfunctional families and populated by weak, despairing people. In college she struggled when her professors described depravity and chaos in poor neighborhoods but never mentioned the grandmothers who used what little food they had to cook a meal for someone down the street who had even less. "Growing up that way and then hearing the [media and academic] representation of those spaces," she says, "I couldn't make sense of it. What I was reading didn't match my lived experience."

That dissonance led Mattis to pursue positive psychology research, which focuses on individuals' and communities' strengths rather than their deficits. Mattis and other researchers are examining how people in poorer communities subject to discrimination can achieve high levels of social capital, which is the ability to solve problems and thrive by forming mutually trusting, engaged relationships and networks. These particular social ties often bring about desired outcomes that would not be achieved in isolation.

Some researchers, however, believe social capital is the domain of the middle class or wealthy—that distressed or low-income communities cannot manufacture it themselves and therefore rely on interventions to build social capital. In fact, Mattis and other Black researchers have found that even in the most resource-poor neighborhoods, high levels of social capital not only exist but are used as a means to buffer the community against systematic oppression. In a world racked by a pandemic and climate disasters, this form of social consciousness, they say, should be celebrated and deeply studied.

RESILIENCE FROM SOCIAL CAPITAL

THE ROOTS of social capital can be found in the musings of 18th- and 19th-century intellectuals such as Alexis de Tocqueville, who on a visit from France to the U.S. in 1830 discovered that Americans loved to join associations and that such groups had positive effects on their members. "Feelings and ideas are renewed," he wrote, "the heart enlarged, and the understanding developed only by the reciprocal action of men one upon another." The term first turned up in the social science literature in 1916, when L. J. Hanifan, a progressive serving as West Virginia's state supervisor of rural schools, used it to argue for community involvement in schools. "The individual is helpless socially, if left entirely to himself," he wrote. "If he may come into contact with his neighbor …

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there will be an accumulation of social capital, which may immediately satisfy his social needs and which may bear a social potentiality sufficient to the substantial improvement of living conditions in the whole community."

"Social capital" has been used among scholars of economics, politics, anthropology and psychology. It caught the greater public's eye when political science professor Robert D. Putnam of Harvard University published his best-selling 2000 book, *Bowling Alone: The Collapse and Revival of American Community.* In it, Putnam laments the decline of mainstream America's social clubs such as softball leagues, parent-teacher associations and Rotary Clubs, saying we have become so focused on individualism that we even bowl alone rather than in leagues. Putnam attributes this decline to such forces as suburbanization, increased television watching and generational shifts—people who grew up during the stress of the Great Depression and World War II, he says, felt the pull of community in a way that their children and grandchildren did not. He worries that this movement away from social and civic engagement has eroded democracy.

Other scholars elaborated on Putnam's hypotheses about increasing isolation. Harvard sociologist Theda Skocpol has argued that it is driven in part by wealthy Americans who may support professional nonprofits such as the Sierra Club or AARP but are less likely to participate in local grassroots groups. Matthew Crenson and Benjamin Ginsberg, political scientists at Johns Hopkins University, blame it on a range of factors that made it less likely citizens would band together to push the government to listen. For instance, a rise in litigation shifted the action of forcing legislators to change or enact laws from citizen organizing to advocacy groups working through the courts. And before the switch to an all-volunteer professional army, citizen soldiers who were drafted alongside their neighbors and friends made demands such as the expansion of voting rights to 18-year-olds.

Others fault social media for giving a false sense of civic engagement. In 2018 Eitan Hersh, a political science professor at Tufts University, found that a third of surveyed Americans reported spending two hours or more on politics every day. Yet those two hours were nearly always focused on consuming political news, arguing about politics online and thinking about politics. This "political hobbyism," he says, threatens our democracy because it takes up the time of well-meaning citizens who might otherwise be pursuing real political power by attending local planning meetings or knocking on doors to engage neighbors.

Examples from other nations show that social capital often improves mental health. For instance, social epidemiologist Ichiro Kawachi of Harvard has found that older survivors of a Japanese earthquake who had to move to temporary housing and therefore lost their long-standing social connections suffered greater cognitive decline than those who were able to remain in their homes. Epidemiologist Helen L. Berry of the University of Sydney has found examples of how collective responses to natural disasters can increase social capital. For instance, after Oxford, England, was inundated with floods six times in 10 years, an alliance formed in 2007 to work on flood-readiness projects. Berry insists that government leaders must address structural problems that harm communities. At the same time, when residents got together to learn how to install concrete blockades during flood warnings, it gave them a sense of achievement. "Acting for the greater good is powerfully protective of mental health," Berry says.

Most social capital studies—as with most kinds of research—typically focus on white, middle-class people. Some researchers have even doubted that social capital can really take hold in marginalized communities because of pervasive poverty. For instance, in his 2015 book, *Our Kids: The American Dream in Crisis,* Putnam argues there must be an extremely low level of social capital among poor families in the U.S. because they often do not have two parents at home, are less likely to attend church, and find few opportunities to participate in youth sports, scouts and other activities. The examples he uses to make his argument—such as a boy who grew up in a New Orleans housing project who brags about beating up other kids—are the kind that frustrate Mattis.

She, along with other Black researchers and Black community leaders, argues that social capital can be found in poor and marginalized neighborhoods if one bothers to look. "There have always existed pockets of resilience and agency embedded within even the most marginalized urban spaces," wrote LeConté Dill, a professor at Michigan State University, in a 2011 paper. While earning her doctorate at the University of California, Berkeley, Dill became interested in the protective factors that create resilience. She spent a summer observing the East Oakland Youth Development Center (EOYDC), where teenagers can participate in hip-hop dance classes, seminars on the Black experience, a "pathway to college" program, and more. One of those teenagers was Lanikque Howard, who grew up in a single-parent household in one of the area's poorest neighborhoods. While Howard's mother was working double shifts, Regina Jackson, who is president and CEO of the center, would drive Howard to the only post office open late so she could mail off yet another batch of scholarship applications.

The first in her family to get a college degree, Howard earned her doctorate in social work, and in 2021 she was chosen by the Biden administration to join the Department of Health and Human Services' Administration for Children and Families. By supporting the development of individual resilience, Jackson has created a community of thriving young adults who then reach back to offer advice and encouragement—personal tours of their college campuses, job leads—to the current teens who are coming up through EOYDC's programming. Dill calls this "bridging" social capital because it can improve the teens' social mobility. She also identified a type of interpersonal social capital that people draw on to "get by" and cope with daily problems—what Jackson describes in lay terms as encouraging a sense of "personal sustainability" in the teens "so they believe that they deserve to be successful." Jackson's charges often return to the Oakland area to work so they can help their old neighborhoods, thus building even more community resilience.

Dill and Mattis, as well as other researchers in psychology, social work, epidemiology, public health, and other fields, are building up a body of published evidence showing that a current of collectivism runs through majority-Black enclaves that can help make people more resilient than they might be otherwise. Their work has sometimes been met with skepticism. Mattis, for example, says peer reviewers have accused her of mak-

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ing up the personal stories of altruism that she has gathered from people she has interviewed (she offered to let them listen to recordings), and some scholars have told her it is irresponsible to study goodness in poor urban spaces because it might give the impression that there are not big problems in places affected by structural racism and inequality.

Mattis counters that it is misleading to ignore altruism and how it helps people cultivate social capital. During the COVID pandemic, scholars have noted how an extreme focus on individualism in American culture has led to tragic results. But that is too sweeping an assessment. "In the Black community, we have to take care of ourselves," says Traci Blackmon, a Missouri pastor. In the early days of the pandemic, her church collected 30,000 masks and many gallons of hand sanitizer to give to Black frontline workers such as bus drivers, grocery store clerks and cafeteria workers. "Black people, in my opinion, and all nonwhite people have this sense of community embedded in our DNA out of necessity that says we have to share what we have in order for everyone to be okay." These altruistic behaviors, Mattis says, "reinforce the fact that you're fully human in a world that doesn't tell you that you're fully human. That gives you a different picture of yourself."

Because so many things in society—democracy, saving lives during a pandemic, action on climate change—work better when we have strong social capital, it makes sense to study how it is created and sustained. Understanding how it manifests in majority-Black communities, Mattis says, could inform efforts to strengthen society overall.

SPIRITUALITY IS WHEN YOU'VE BEEN TO HELL

COLLECTIVISM in Black communities—what some social scientists have called the "Black helping tradition"—can be traced back to at least the late 1700s, when two formerly enslaved men, Richard Allen and Absalom Jones, founded the Free African Society, a mutual-aid society that eventually led to the first U.S. Black religious denomination: African Methodist Episcopal. The society gave newly freed people goods and services they could not get elsewhere: money, jobs, education, clothes, health care and religious instruction.

Churches were some of the few places where Black Americans could gather safely for any kind of public discourse. Martin Luther King, Jr., famously used the church in the fight for civil rights, and the Black Panthers held free breakfasts for Black children in church basements. "For Blacks especially, churches provide an opportunity to be civically engaged, with a protective covering of unity and support," wrote Keon Gilbert, a behavioral sciences professor at St. Louis University, and Lorraine Dean, an epidemiologist at the Johns Hopkins Bloomberg School of Public Health, in their research looking at health and political advocacy.

Mattis began studying religion and spirituality and their connection to the psychological welfare of the Black community by using surveys and in-depth interviews when she was in graduate school at the University of Michigan. At the time, she was struggling with her mother's exhortation—"You have a responsibility to tell our story"—and the often negative portrayals her professors shared about people in majority-Black neighborhoods. She knew from personal experience that religion and spirituality had helped instill resiliency in her neighbors, allowing them to remain hopeful despite their unjust circumstances and to create a sense of responsibility toward one another. "It was the thing that helped everyone I knew live lives of dignity," she says.

Her work has shown that many Black Americans take solace in a kind of racial righteousness—a conviction that racism is a sin in the eyes of God and that Jesus, who championed the oppressed, is on their side—and this belief is a source of optimism. She has also found a distinction between religion and spirituality. As one woman she interviewed put it: "Religion is what you do when you're afraid of going to hell, and spirituality is what you do when you've already been there." That sentiment, Mattis says, "captures what happens when life really pushes you to your limits. You develop a personal sense of what's sacred, what's important."

She points out that it is a relationship that does not always sit well with mainstream, predominantly white psychology. Sigmund Freud notably described religions as escapist, illogical and pathological responses to adversity and existential angst. The push for psychology to become evidence-based has led many scholars to shy away from looking at religion and spirituality as relevant to mental health. Further complicating the matter is the fact that studies also show that psychologists and therapists overwhelmingly identify as atheist or agnostic. "As a young student, I learned early on that social work was a secular field and that people who have a strong faith background almost have to be prepared to tuck it in their pocket," says Ratonia Runnels, an assistant professor of social work at Texas Woman's University, who nonetheless studies how religion might be integrated into social work.

In 2011 Runnels published a study looking at how Black survivors of Hurricane Katrina used spirituality and religion to cope. She and her co-authors analyzed interviews with 52 Black survivors and 98 service providers described as government officials, therapists, social workers, pastors, case managers and volunteers. Their work showed that the secular providers were surprised by the survivors' deep faith. They also found that some pastors were treated with hostility. One pastor said he was rebuffed when he tried to counsel survivors at a shelter; officials told him they had medical staff to take care of physical needs and mental health workers to take care of mental health needs. The man said he pointed out that there was another component, people's spiritual needs, but was turned away.

As a Black woman who is religious herself, Runnels understands that the spirituality found in Black churches—a belief that a higher power is looking out for the congregants—inspires people to be the embodiment of that power by taking care of one another. Black liberationist theology, which emerged during the Civil Rights Movement, emphasizes that social action on behalf of the Black community is part of the spiritual responsibility of the faithful. And because worshippers share a similar identity and values—two things that Putnam says are key—social capital flows in such spaces.

Charles X. White of Houston, a school safety consultant by day and a community worker by night, sometimes uses churches to hold his long-running series of community breakfasts focused on civic engagement. The attendees, mostly older women, recite a pledge in which they promise to work to better their neighborhoods. Between bites of biscuits and gravy, they listen as White, who speaks in a deep baritone, introduces speakers such as politicians looking for help getting out the vote, city

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health and human services workers explaining how to file pollution complaints, and county police officers demonstrating evacuation techniques for extreme weather events. The last is a crucial topic to his audience. After suffering through Hurricane Harvey in 2017, people want to be more prepared for the next storm, but they are not confident that they can be. Some worry that if they are too pushy—say, insisting that public works employees clear debris from drainage ditches near their homes to prevent flooding—city workers might retaliate by sending police to harass them. "There's a lot of fear," says White, who encourages his attendees to overcome anxieties and take action by giving them hard facts such as a copy of the city code on drainage-ditch maintenance.

"When people are uncertain, they don't push," he says. "But most people get emboldened once they know they're right. They'll hold up this piece of paper and say, 'Hey, look, man, this is what the code says!'"

There is evidence that White's breakfasts are doing exactly what Kawachi and Berry say social capital does: bolstering people's psyches. Two months after Harvey hit, Garett Sansom, an associate professor at Texas A&M's School of Public Health, came to a breakfast meeting to see whether he could gauge how a group of Houston's low-income Black residents were faring after the storm. Sansom administered the 12-item Short-Form Health Survey, a standard public health tool that measures physical and mental health, to the 153 people in the audience. The results surprised him. The survey almost always shows a correlation between physical and mental health scores—if one is low, so is the other. "That's been shown across lots of different communities, including the African American community," he says. "But what we found was that in this group, even though they had greatly reduced physical health scores ... they actually had higher mental health scores." In other words, despite living in neighborhoods that suffered some of the worst impacts of the storm, they were less depressed, traumatized and anxious than other people in the area.

Mattis knows well the positive effects of social capital on mental health. Yet she cautions against using conventional definitions of success as proof of resilience. At the library in Ann Arbor, her story about Saniyka, the valedictorian, doesn't have an obvious fairy-tale ending. Saniyka still dreams of going to college but for a variety of reasons has not yet attended one. Nevertheless, the young woman is employed at a nonprofit that works with vulnerable people. Having been homeless herself (she now shares a one-bedroom apartment with four people she met in the tent city), Saniyka has thrived in this position, according to Mattis. She approaches people she meets on the street and engages them in conversation, hoping to learn their hidden talents and encourage them to contribute to her organization. Saniyka recognizes that every person has something valuable to offer—a perspective that Mattis shares.

If academics, policy makers and others in the mainstream fail to see the social capital in marginalized communities—the ways people cope and even thrive in very difficult circumstances—then society as a whole suffers, Mattis says. "You see people who are much better resourced than [Saniyka] who sort of lapse into this mindset of hopelessness and selfishness in the face of adversity," she explains. "And Saniyka, instead of looking inward and becoming isolated, takes all those experiences and decides to focus outward on changing the world so it doesn't have to look that way for others." SA

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Deepening Fault Lines

The pandemic energized the Black Lives Matter movement—and provoked a dangerous backlash

By Aldon Morris

IN 2020, AS THE BODIES PILED UP DURING the pandemic, it became clear that people of color were dying at far higher rates than white people. They had the jobs that exposed them to infections, the comorbidities that made them more likely to get very sick, and less ability to access quality health care than white Americans. The toll revealed in very stark ways that racial disparities and racism were alive and well in the U.S.

At the same time, police were attacking Black people, and those attacks were being disseminated far and wide via new visual technologies. Just as COVID laid bare the racial disparities, the murder of George Floyd unfolded in front of millions of eyes in a way that made racial oppression undeniable. Not only was the structural racism in American society displayed in all its hideousness, but people were dissecting and debating it across social media in a way that had never been possible before.

For social justice movements to erupt, you need a diagnosis of the problem. No matter how much suffering there is, oppression, inequality and injustice can be thought of as natural. The Bible

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CELEBRATING JUNETEENTH, a day that marks the end of U.S. slavery, residents of Richmond, Va., gathered on June 21, 2020, at a Confederate monument they had reclaimed. The memorial was reimagined to honor victims of police brutality and called Marcus-David Peters Circle, after a man who was shot dead by Richmond police in 2018.

Carlos Bernate/Redux Pictures

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FAR-RIGHT PROTESTERS, including members of the Proud Boys, a neo-fascist group, marched against COVID vaccine mandates in Manhattan in November 2021. More than three dozen people affiliated with the Proud Boys have been charged in connection with the attack on the U.S. Capitol on January 6, 2021.

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Mark Peterson/Redux Pictures

says, for example, that the poor will always be among us. Some people see it that way—it is just fate. Or defective genes or culture. A real diagnosis was finally on the table, being discussed not only by a few scholars and activists but by Americans at large.

Understanding the depth of the injustice made people angry, and they came out in the streets in unprecedented numbers. In this manner, the pandemic dovetailed with police oppression and technology to energize the Black Lives Matter (BLM) movement. In addition, COVID nearly shut down the economy, giving many more people opportunities to protest. During the Civil Rights Movement (CRM), college students were especially available for sit-ins and other protests on so-called T-days—Tuesdays and Thursdays—when they had no classes. But at the height of the pandemic, far more people had the time to join the BLM and other protests. And there was another breakthrough: for the first time in American history, people of diverse classes, races and ethnicities joined a movement against racial oppression.

These protests led to important gains. For the first time, there is serious public deliberation on the disparities in health, schooling, access to universities and wealth that persist along racial lines. The police are more aware of the possibility of being held accountable. And a debate over reparations for slavery has sprung up—something hitherto unthinkable. More broadly, the intersection of the pandemic, police brutality and modern technology has spurred a very vibrant progressive movement in the country and the world.

How lasting the gains will be is far from clear. Worryingly, the massive social justice movements energized countermovements that are determined to halt any progressive changes to American society. The political right has gathered new strength, to the extent that it threatens to set us back to an era before the CRM. Among that movement's great achievements are the 1964 Civil Rights Act and the 1965 Voting Rights Act. What is under attack now? It is precisely the right to vote. Multiple states now have laws that restrict the rights of so-called minority voters, meaning voters of color.

The Kyle Rittenhouse case, in which a vigilante who shot white people participating in largely Black protests in 2020 was completely exonerated, is also alarming. In the 1960s segregationists attacked white participants in the CRM, describing them as race traitors. Rittenhouse's assault has similar overtones. Now white people know that not only can conservatives attack them if they participate in protests, but the courts may also side with the attackers. Going forward, will they be willing to risk their lives for a cause that is not directly theirs? And how can we ignore the insurrection of January 6, 2021, when a predominantly white armed mob sought to annul the outcome of the presidential election?

As I see it, a very serious clash is taking place between progressive and conservative forces, between people who are fighting for equality and people who are fighting to maintain the status quo. It is not clear who will triumph. What is clear is that America is at its highest level of polarization in modern history. I can imagine it must have looked something like this prior to the Civil War. We are at a cusp, and we could fall on either side—into the chasm of fascism or into a more hopeful, democratic world. SA

Aldon Morris is Leon Forrest Professor of Sociology and African American Studies at Northwestern University and a previous president of the American Sociological Association. His landmark books include *The Origins of the Civil Rights Movement* (1986) and *The Scholar Denied: W.E.B. Du Bois and the Birth of Modern Sociology* (2015).

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A Tapestry of Alternatives

Making peace with the biosphere will require building communities and relationships that are focused on sustaining life—human and nonhuman

Text and photographs by Ashish Kothari

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INDIGENOUS SEEDS, nourished by rainwater and organic supplements, help Nadimidoddi Vinodamma of the Deccan Development Society (DDS), a farmers' cooperative in southern India, grow enough food to feed her family and sell in local markets.

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NO ONE IN HER VILLAGE FACED FOOD SHORTAGES DURING THE lockdowns, nor did they suffer from COVID-19, Moligeri Chandramma assured me through an interpreter in March 2021. A farmer in the drylands of southern India, she grows more than 40 species and varieties of crops—mostly native millets, rice, lentils and spices—on a bit more than a hectare of land. Chandramma is a member of the Deccan Development Society (DDS), a cooperative of nearly 5,000 Dalit (oppressed caste) and Adivasi (Indigenous) women whose remarkable integration of biodiversity conservation with agricultural livelihoods earned them the United Nations' prestigious Equator Award in 2019. Emerging from a situation of extreme malnutrition and social and gender discrimination in the 1980s, these farmers now enjoy food sovereignty and economic security. Not only are they weathering the pandemic, but in 2020 each family in DDS contributed around 10 kilograms of food grains to the region's relief effort for those without land and livelihoods.

On the other side of the world, six Indigenous Quechua communities of the Peruvian Andes govern the Parque de la Papa (Potato Park) in Pisac, Cusco, a mountainous landscape that is one of the original homelands of the potato. They protect the region as a "biocultural heritage" territory, a trove of biological and cultural riches inherited from ancestors, and conserve more than 1,300 varieties of potato. When I visited in 2008 with other researchers and activists, I was stunned into silence by the diversity.

"This is the outcome of 20 years' consistent work in relocalizing our food system, from a time when we had become too dependent on outside agencies for our basic needs," farmer Mariano Sutta Apocusi told Local Futures, an organization dedicated to strengthening communities worldwide, in August 2020. "Focusing on the local has helped us improve access to and affordability of a great diversity of food products—especially native potatoes, quinoa, kiwicha, other Andean tubers and maize, which we cultivate using Indigenous agroecological methods." The communities instituted strong health and safety measures when the pandemic hit, even as they harvested a bumper crop and distributed more than a ton of potatoes to migrants, the elderly and a shelter for abused teenage mothers in Cusco town.

In Europe, many "solidarity economy" initiatives, which promote a culture of caring and sharing, swung into action when COVID-related lockdowns rendered massive numbers of people jobless. In Lisbon, Portugal, the social centers Disgraça and RDA69, which strive to re-create community life in an otherwise highly fragmented urban situation, reached out with free or cheap food to whoever needed it. They provided not only meals but also spaces where refugees, the homeless, unemployed young people and others who might otherwise have fallen through the cracks could interact with and develop relationships with better-off families, creating a social-security network of sorts. The organizers trusted those with adequate means to donate food or funds to the effort, strengthening the feeling of community in surrounding neighborhoods.

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MOLIGERI CHANDRAMMA manages the DDS seed bank (*left*). It contains more than 70 species and varieties of crops. People gathered (*above*) in 2005 to mark 20 years of sustained protests against dam construction on the Narmada River.

The pandemic has exposed the brittleness of a globalized economy that is advertised as benefiting everyone but in fact creates deep inequalities and insecurities. In India alone, 75 million people fell below the poverty line in 2020; globally, hundreds of millions who depend for their survival and livelihoods on the long-distance trade and exchange of goods and services were badly hit. Similar, albeit less extreme, dislocations also appeared during the 2008 financial crisis, when commodity speculation, along with the diversion of food grains to biofuel production, precipitated a steep rise in global grain prices, leading to hunger and food riots in many countries that depended on imported food. Threats to survival also emerge when war or other dislocations stop the movement of goods. In such crises, communities fare better if they have local markets and services and can provide their own food, energy and water while taking care of the less fortunate.

The value of these alternative ways of living goes far beyond their resilience during relatively short-term upheavals like the pandemic, however. As a researcher and environmental activist based in a "developing" country, I have long advocated that the worldviews of peoples who live close to nature be incorporated into global strategies for wildlife protection, such as at the International Union for Conservation of Nature and the U.N. Convention on Biological Diversity. And in recent decades I have come to agree with critics of globalization such as social scientist and environmentalist Wolfgang Sachs that fending off calamities such as biodiversity collapse will require not only environmental adaptations but also radical changes to the dominant economic, social and even political paradigms.

In 2014 a few of us in India initiated a process to explore pathways to a world in which people are at peace with one another and with nature. Five years later (and fortuitously, just before the pandemic hit), the endeavor grew into an international online network we called the Global Tapestry of Alternatives. These conversations and other research indicate that viable options, no matter where they are, tend to be based on self-reliance and solidarity.

Such values are at odds with globalization, which delivers to denizens of the Global North (the better off, no matter where we live) many things that we have come to regard as essential. In contrast to the promise of ever increasing material wealth that underpins our civilization, people who live near or beyond its margins have a multitude of visions for living well, each tailored to the specifics of their ecosystems and cultures. To walk away from the cliff edge of irreversible destabilization of the biosphere, I believe we must enable alternative structures, such as those of the Dalit farmers, the Quechua conservers and the Lisbon volunteers, to flourish and link up into a tapestry that ultimately covers the globe.

AN ENLIGHTENING JOURNEY

GROWING UP IN INDIA, where lifestyles that are intimately entwined with the natural environment survive in large pockets, unquestionably influenced my ideas of what constitutes true sustainability. In the 1970s, as a high school student who loved bird-

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watching in forests around Delhi, I joined classmates to demonstrate outside the Saudi Arabian embassy when some princes arrived in the country to hunt the (now critically endangered) Great Indian Bustard. Our protest, along with that of the Bishnoi community in Rajasthan, which traditionally protects these birds and other wildlife, embarrassed the Indian government into requesting that the hunters go home. Many of us went on to campaign for protection of the Delhi Ridge Forest, one of the world's biggest urban jungles. In 1979 we formed an environmental group to systematize our efforts. We called it Kalpavriksh, after a mythical tree that makes wishes come true; the name symbolized our growing awareness that nature gives us everything.

Our activism would teach us at least as much as we learned in school and college. While investigating the sources of Delhi's air pollution, for instance, we interviewed villagers who lived around a coal-fired power plant just outside the city. They turned out to be far worse affected by its dust and pollution than we city dwellers were—although they got none of its electricity. The benefits of the project flowed mainly to those who were already better off, whereas the disempowered experienced most of the harms.

In late 1980 we traveled to the western Himalayas to meet the protagonists of the iconic Chipko movement. Since 1973 village women had been protecting trees slated for logging by the forest department or by companies based in the Indian plains with their bodies. The deodars being felled, as well as the oaks, rhododendrons, and other species, were sacred, the women told us, as well as being essential for their survival. They provided cattle fodder, fertilizer and wild foods and sustained their water sources. Even as an urban student, I could see the central role that rural women played in protecting the environment—as well as the injustice of distant bureaucrats making decisions with little concern for how they impacted those on the ground.

Soon after, my friends and I learned that 30 major dams were to be constructed on the Narmada River basin in central India. Millions worshipped the Narmada as a tempestuous but bountiful goddess—so pristine that the Ganga is believed to visit her every year to wash away her sins. Trekking, boating and riding buses along its length of 1,300 kilometers, we were dazzled by waterfalls plunging into spectacular gorges, densely forested slopes teeming with wildlife, fields of diverse crops, thriving villages and ancient temples, all of which would be drowned. We began to question the concept of development itself. Surely the destruction would far outweigh any possible benefits? Almost four decades later our fears have proved tragically true. Hundreds of thousands of displaced people still await proper rehabilitation, and the river downstream of the dams has become a trickle—enabling seawater to reach 100 kilometers inland.

Over the years I came to understand how powerful economic forces reach around the globe to intimately link social injustice with ecological destruction. The era of colonization and slavery vastly expanded the economic and military reach of some nation-states and their allied corporations, enabling the worldwide extraction of natural resources and exploitation of labor to feed the emerging industrial revolution in Europe and North America. Economic historians, anthropologists, and others have demonstrated how this painful history laid the foundation of today's global econ-

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PARQUE DE LA PAPA (*left*) in Peru is one of the original homelands of the potato. The Quechua Indigenous people (*center*) govern the region as a "biocultural heritage" territory, conserving a remarkable diversity of potatoes (*right*).

omy. Apart from driving irreversible ecological damage, this economic system robs many communities of access to the commons—to rivers, meadows and forests essential for their survival—while creating a dependence on external markets. The massive suffering during the pandemic has merely exposed these historical and contemporary fault lines.

During my wanderings over the decades and especially while researching a book with economist Aseem Shrivastava, I became aware of a far more hopeful trend. Across the country and indeed around the world, hundreds of social movements are empowering the marginalized to wrest back control over their lives and livelihoods. In 2014 Kalpavriksh initiated a series of gatherings called Vikalp Sangam, or Confluence of Alternatives, where the drivers of these spirited efforts could come together, share ideas and experiences, and collaborate, helping to build a critical mass for change.

These interactions and eclectic reading gave me insights into a vital question I was investigating: What are the essential characteristics of desirable and viable alternatives? Happily, I was far from alone in this quest. At a degrowth conference in Leipzig in 2014, I was excited to hear Alberto Acosta, an economist and former politician from Ecuador, speaking on *buen vivir,* an Indigenous worldview founded on living well with one another and with the rest of nature. Although Acosta spoke no English and I spoke no Spanish, we tried excitedly to converse; subsequently, degrowth expert Federico Demaria joined us and helped to translate. We decided to work on a compilation of thriving alternatives from around the world, jotting down 20 possible ideas on the back of an envelope. Later we roped in development critic Arturo Escobar and ecofeminist Ariel Salleh as co-editors of a volume we called *Pluriverse.* The number of entries expanded to more than 100.

COMMONALITIES

THOUGH DAZZLINGLY DIVERSE, the alternatives emerging worldwide share certain core principles. The most important is sustaining or reviving community governance of the commons—of land, ecosystems, seeds, water and knowledge. In 12th-century England, powerful people began fencing off, or "enclosing," fields, meadows, forests and streams that had hitherto been used by all. Enclosures by landlords and industrialists expanded to Europe and accelerated with the industrial revolution, forcing tens of millions of dispossessed people to either become factory workers or emigrate to the New World, devastating native populations. Imperial nations seized large portions of continents and reconfigured the economies of the colonies, extracting raw materials for factories, capturing markets for exports of manufactured goods, and obtaining foods such as wheat, sugar and tea for the newly created working class. In this way, colonizers and their allies established a system of perpetual economic domination that generated the Global North and the Global South (the world of the marginalized, no matter where they live).

The wave of anticolonial movements in the first few decades of the 20th century, many of them successful, sparked fears that supplies of raw materials for industries and markets for finished goods of higher value would dry up. President Harry S. Truman responded by launching a program for alleviating poverty in what he described as "underdeveloped areas" with their "primitive and stagnant" economies. As detailed by ecologist Debal Deb, newly formed financial institutions controlled by the rich countries helped the ex-colonies "develop" along the path blazed by the West, providing the materials and energy sources for and creating markets for cars, refrigerators and other consumer goods. An integral aspect of development, as thus conceived, propagated and usually enforced by stringent conditions attached to loans from the World Bank and the

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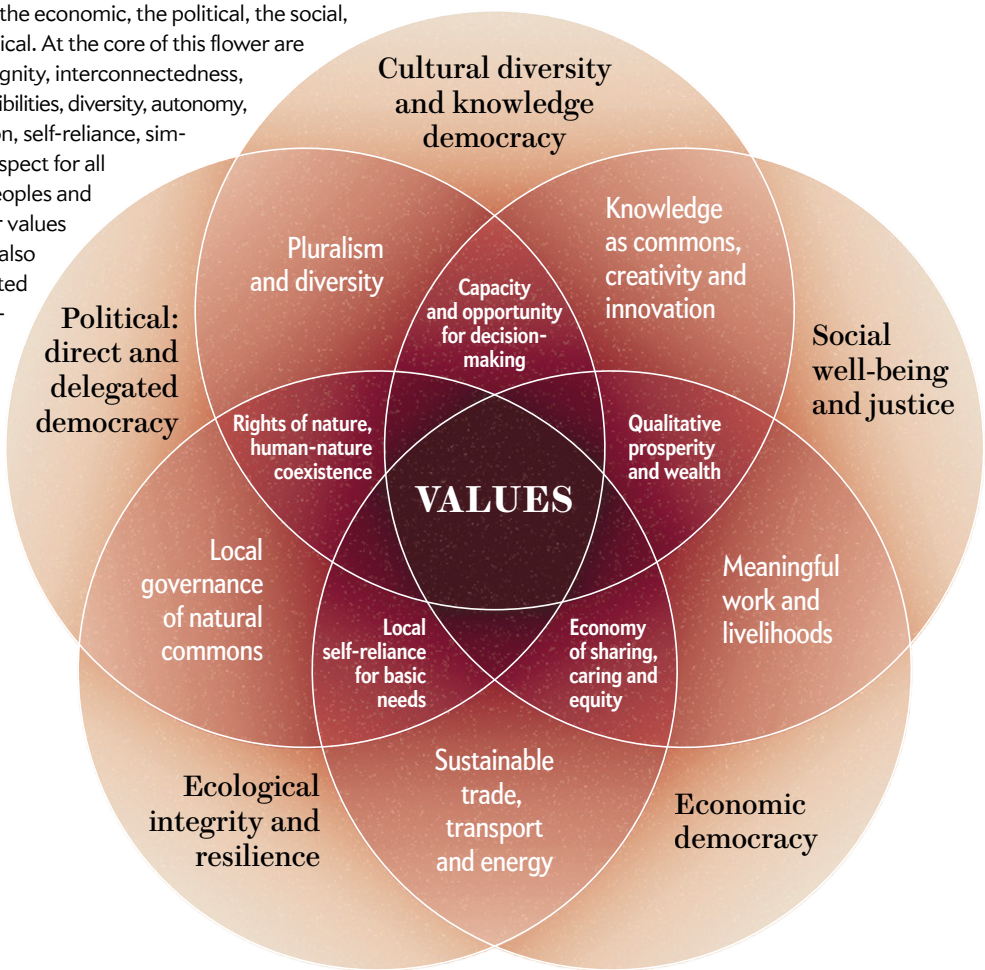
Spheres of Transformation

Creating a sustainable and equitable world will require metamorphoses in five intersecting realms: the economic, the political, the social, the cultural and the ecological. At the core of this flower are values such as solidarity, dignity, interconnectedness, rights coupled with responsibilities, diversity, autonomy, freedom, self-determination, self-reliance, simplicity, nonviolence, and respect for all forms of life. Indigenous peoples and others have lived by similar values for centuries, and they are also being embraced and asserted by people in industrial societies as solutions to global ecological and social crises.


Cultural diversity and knowledge democracy
Pluralism and diversity
Knowledge as commons, creativity and innovation
Political: direct and delegated democracy
Capacity and opportunity for decision-making
Social well-being and justice
Rights of nature, human-nature coexistence
Qualitative prosperity and wealth
VALUES
Local governance of natural commons
Meaningful work and livelihoods
Local self-reliance for basic needs
Economy of sharing, caring and equity
Ecological integrity and resilience
Sustainable trade, transport and energy
Economic democracy

Source: "Alternatives Transformation Format: A Process for Self-Assessment and Facilitation towards Radical Change," prepared by Kalpavriksh for ACKnowl-EJ (*chart reference*)

International Monetary Fund, has been privatization or state confiscation of the commons to extract metals, oil and water.

As Elinor Ostrom, winner of the 2009 Nobel Memorial Prize in Economic Sciences, demonstrated, however, the commons are far more sustainably governed by the communities from which they are wrested than by the governments or corporations that claim them. This awareness has given rise to innumerable grassroots efforts to protect the surviving commons and reestablish control over others. What constitutes the commons has also expanded to include "physical and knowledge resources that we all share for everyone's benefit," explains sociologist Ana Margarida Esteves, who helps with the European Commons Assembly, an umbrella organization for hundreds of such endeavors.

Many of the efforts resemble the DDS and the Parque de la Papa in using community governance of commonly held resources to enhance agroecology (smallholder farming that sustains soil, water and biodiversity) and food sovereignty (control over all means of food production, including land, soil, seeds and the knowledge of how to use them). The food-sovereignty movement La Via Campesina, which originated in Brazil in 1993, now includes about 200 million farmers in 81 countries. Such attempts at self-reliance and community governance extend also to other basic needs, such as for energy and water. In Costa Rica, Spain and Italy, rural cooperatives have been generating electricity locally and controlling its distribution since the 1990s. And hundreds of villages in western India have moved toward "water democracy," based on decentralized harvesting of water and community management of wetlands and groundwater. Mobilizing people to sustain, build or rebuild local systems of knowledge is essential to such ventures.

Secure rights to govern the commons are also important. In the Ecuadorian Amazon, the Sapara Indigenous people fought hard to gain collective rights over their rain-forest home. They are now defending it against oil and mining interests while developing a model of economic well-being that blends their traditional cosmovisions—ways of knowing, being and doing that are physically and spiritually linked to their environs—with new activities such as community-led ecotourism. Their income from

Graphic by Federica Fragapane

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tourism has dropped during the pandemic, but their forests and community ethic give them almost all the food, water, energy, housing, medicines, enjoyment, health and learning that they need. They are now offering online sessions on their cosmovisions, dream analysis and healing. I participated in such sessions in person in their Naku ecotourism camp in 2019. The virtual version is not as immersive but nonetheless represents an innovative adaptation to the circumstances.

Greening cities or making them more welcoming, as the Lisbon social centers do, also requires community-based governance and economies of caring and sharing. Across the Global South, development projects have driven hundreds of millions of people to cities, where they live in slums and work in hazardous conditions. Wealthy city dwellers could do their part by consuming less, which would reduce the extraction and waste dumping that displace people in faraway places. A spectrum of avenues toward more equitable and sustainable cities has emerged. These include, for example, the Transition Movement, which is attempting to regenerate the commons and make European cities carbon-neutral, and the municipalism movement, which is creating a network of Fearless Cities, among them Barcelona, Valparaiso, Madrid and Athens, to provide secure environments for refugees and migrants. Urban agriculture in Havana supplies more than half of its fresh food requirements and has inspired many other city farming initiatives around the world.

FIVE PETALS

THESE INITIATIVES POINT TO the need for fundamental transformations in five interconnected realms. In the *economic sphere,* we need to get away from the development paradigm—including the notion that economic growth, as measured by gross domestic product (GDP), is the best means of achieving human goals. In its place, we need systems for respecting ecological limits, emphasizing well-being in all its dimensions and localizing exchanges to enable self-reliance—as well as good measures of these indicators. Bhutan has long experimented with gross national happiness as an index; the idea has spawned variants, such as New Zealand's recent focus on mental health and other such measures of progress.

We also need freedom from centralized monetary and financial control. Many experiments in alternative currencies and economies based on trust and local exchanges are underway. Perhaps the most innovative of these is "time banking," a system for swapping services founded on the principle that all skills or occupations merit equal respect. One can, for example, give a one-hour-long yoga lesson for credit that can be redeemed for an hour's work on bicycle repair.

In many parts of the world, workers are seeking to control the means of production: land, nature, knowledge and tools. A few years back I visited Vio.Me, a detergent factory in Thessaloniki, Greece, which workers had taken over and converted from chemical to olive-oil-based and eco-friendly production, and where they had established complete parity in pay, regardless of what job the worker was doing. The slogan on their wall proclaimed: "We have no boss!"

In fact, work itself is being redefined. Globalized modernity has created a chasm between work and leisure—which is why we wait desperately for the weekend! Many movements seek to bridge this gap, enabling greater enjoyment, creativity and satisfaction. In industrial countries, people are bringing back manual ways of making clothes, footwear or processed foods under banners such as "The future is handmade!" In western India,

WORKERS such as Dimitris Koumatsioulis (*top*) collectively run Vio.Me, an eco-friendly detergent factory in Thessaloniki, Greece. In Prague, Czech Republic, people buy and sell locally (*bottom*) at a farmers' and producers' market.

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KUZGUNCUK BOSTAN, an urban commons in Istanbul, Turkey, enables city dwellers to collectively grow their own fruit, vegetables and other produce.

many young people are leaving soul-killing routines in factories to return to handloom weaving, which allows them to control their schedules while providing a creative outlet.

In the *political sphere,* the centralization of power inherent in the nation-state, whether democratic or authoritarian, disempowers many peoples. The Sapara nation in Ecuador and the Adivasis of central India argue for a more direct democracy, where power resides primarily with the community. The state—insofar as it continues to exist—would then mainly help with larger-scale coordination while being strictly accountable to decision-making units on the ground. The ancient Indian notion of *swaraj,* literally translated as "self-rule," is particularly relevant here. It emphasizes individual and collective autonomy and freedom that are linked to responsibility for others' autonomy and freedom. A community that practices *swaraj* may not dam a stream, for example, if that threatens the water supply of downstream villages; its well-being cannot compromise that of others.

Such a notion of democracy also challenges the boundaries of nation-states, many of which are products of colonial history and have ruptured ecologically and culturally contiguous areas. The Kurdish people, for instance, are split among Turkey, Iran, Iraq and Syria. For three decades they have struggled to achieve autonomy and direct democracy based on principles of ecological sustainability and women's liberation—and without borders dividing them. And Indigenous groups in Mexico collectively identifying as Zapatistas have for more than three decades asserted and sustained an autonomous region based on similar principles.

Moving toward such radical democracy would suggest a world with far fewer borders, weaving tens of thousands of relatively autonomous and self-reliant communities into a tapestry of alternatives. These societies would connect with one another through "horizontal" networks of equitable and respectful exchange, as well as through "vertical" but downwardly accountable institutions that manage processes and activities across the landscape.

Several experiments in bioregionalism at large scales are underway, although most remain somewhat top-down in their governance. In Australia, the Great Eastern Ranges Initiative seeks to coordinate the conservation of ecosystems across 3,600 kilometers while sustaining livelihoods and community health. And a project spanning six countries in the Andes aims to conserve as a World Heritage Site the Qhapaq Ñan, a 30,000-kilometer network of roads built by the Inca Empire, along with its related cultural, historical and environmental heritage.

Local self-governance may, of course, be oppressive or exclusionary. The intensely patriarchal and casteist traditional village councils in many parts of India and the xenophobic antirefugee approaches of the right wing in Europe illustrate this drawback. A third crucial sphere of transformation is therefore *social justice,* encompassing struggles against racism, casteism, patriarchy, and other traditional or modern forms of discrimination and exploitation. Fortunately, success in defying the dominant economic system often goes hand in hand with victories against discrimination, such as Dalit women farmers' shaking off centuries of caste and patriarchal oppression to achieve food sovereignty.

Political autonomy and economic self-reliance need not mean isolationism and xenophobia. Rather cultural and material exchanges that maintain local self-reliance and respect ecological

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sustainability would replace present-day globalization—which perversely allows goods and finances to flow freely but stops desperate humans at borders. This kind of localization would be open to people in need; refugees from climate change or war would be welcomed, as in the network of Fearless Cities in Europe. Both grounded practice and shifts in policy could help transit toward such a system. Necessary, of course, are attempts to rebuild societies in regions of strife so that people do not have to flee from them.

Radical change also necessitates transformations in a fourth sphere: that of *culture and knowledge.* Globalization devalues languages, cultures and knowledge systems that do not adapt to development. Several movements are confronting this homogenizing tendency. The Sapara nation is trying to resuscitate its almost extinct language and preserve its knowledge of the forest by bringing these into the curriculum of the local school, for instance. Many communities are "decolonizing" maps, putting back their own place names and defying political borders. Even the colonial-era Mercator projection used to generate the familiar world map is being upended. (Only recently did I realize that Africa is large enough to contain Europe, China, the U.S. and India put together.) Increasingly, traditional and modern sciences are collaborating to help solve humankind's most vexing problems. The Arctic Biodiversity Assessment, for example, involves cooperation among Indigenous peoples and university scientists to tackle climate change.

One problem is that present-day educational institutions train graduates who are equipped to serve and perpetuate the dominant economic system. People are bringing community and nature back into spaces of learning, however. These efforts include Forest Schools in many parts of Europe that provide children with hands-on learning in the midst of nature, the Zapatista autonomous schools that teach about diverse cultures and struggles, and the Ecoversities Alliance of centers of higher learning around the world that enable scholars to seek knowledge across the boundaries that typically separate academic disciplines.

The most important sphere of transformation, however, is the *ecological*—recognizing that we are part of nature and that other species are worthy of respect in their own right. Across the Global South, communities are leading efforts to regenerate degraded ecosystems and wildlife populations and conserve biodiversity. Tens of thousands of "territories of life" are being governed by Indigenous or other local communities, for example. These include locally managed marine areas in the South Pacific, Indigenous territories in Latin America and Australia, community forests in South Asia, and the Ancestral Domain territories in the Philippines. Also noteworthy is legislation or court judgments in several countries asserting that rivers, for example, enjoy the same protections as people. The U.N. 2009 Declaration on Harmony with Nature is an important milestone toward such a goal.

VALUES

I AM OFTEN ASKED how one scales up successful alternatives. It would be self-defeating, however, to try to either scale up or replicate a DDS or a Parque de la Papa. The essence of this approach is diversity: the recognition that every situation is different. What people can do—and this, indeed, is how successful initiatives spread—is understand the underlying values and apply these in their own communities while networking with like ventures to spread the impact.

The Vikalp Sangam process has identified the following values as crucial: solidarity, dignity, interconnectedness, rights and responsibilities, diversity, autonomy and freedom, self-reliance and self-determination, simplicity, nonviolence, and respect for all life. Around the world both ancient and modern worldviews that are focused on life articulate similar principles. Indigenous peoples and other local communities have lived by worldviews such as *buen vivir, swaraj, ubuntu* (an African philosophy that sees the well-being of all living things as interconnected) and many other such ethical systems for centuries and are reasserting them. Simultaneously, approaches such as degrowth and ecofeminism have emerged from within industrial societies, seeding powerful countercultures.

At the heart of these worldviews lies a simple principle: that we are all holders of power. That in the exercise of this power, we not only assert our own autonomy and freedom but also are responsible for ensuring the autonomy of others. Such a *swaraj* merges with ecological sustainability to create an eco-*swaraj,* encompassing respect for all life.

Clearly, such fundamental transformations face a deeply entrenched status quo that retaliates violently wherever it perceives a threat. Hundreds of environmental defenders are murdered every year. Another serious challenge is the unfamiliarity many people in the Global North have with ideals of a good life beyond the American dream. Even so, the fact that many progressive initiatives are thriving and new ones are sprouting suggests that a combination of resistance and constructive alternatives does stand a chance.

The COVID pandemic is a catastrophe that presents humankind with a choice. Will we head right back toward some semblance of the old normal, or will we adopt new pathways out of global ecological and social crises? To maximize the likelihood of the latter, we need to go well beyond the Green New Deal approaches in the U.S., Europe, and elsewhere. Their intense focus on the climate crisis and worker rights is valuable, but we also need to challenge unsustainable consumption patterns, glaring inequalities and the need for centralized nation-states.

Truly life-sustaining recoveries would emphasize all the spheres of eco-*swaraj,* arrived at via four pathways. One is the creation or revival of dignified, secure and self-reliant livelihoods for two billion people based on collective governance of natural resources and small-scale production processes such as farming, fisheries, crafts, manufacturing and services. Another is a program for regeneration and conservation of ecosystems, led by Indigenous peoples and local communities. A third is immediate public investments in health, education, transportation, housing, energy and other basic needs, planned and delivered by local democratic governance. Finally, incentives and disincentives to make production and consumption patterns sustainable are crucial. These approaches would integrate sustainability, equality and diversity, giving everyone, especially the most marginalized, a voice. A proposal for a million climate jobs in South Africa is of this nature, as is a feminist recovery plan for Hawaii and several other proposals for social justice in other countries.

None of this will be easy, but I believe it is essential if we are to make peace with Earth and among ourselves. SA

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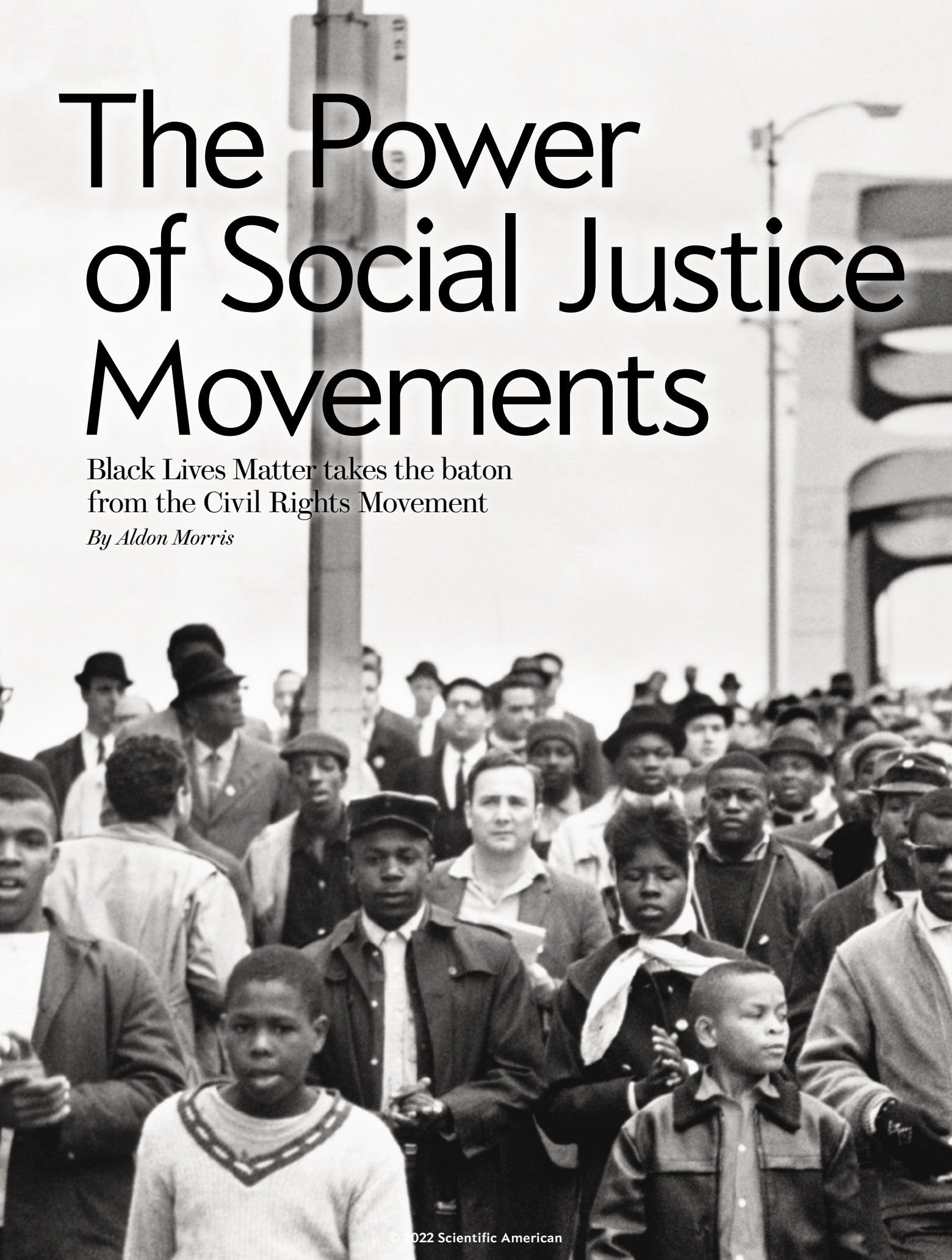
The Power of Social Justice Movements

Black Lives Matter takes the baton from the Civil Rights Movement

By Aldon Morris



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CIVIL RIGHTS supporters march from Selma to Montgomery in Alabama on March 9, 1965, in a campaign to register Black voters. Days earlier a similar group of nonviolent protesters had been brutally beaten by state troopers at the Edmund Pettus Bridge. This time Martin Luther King, Jr., who led the march, avoided confrontation and asked the campaigners to kneel and pray at the site of the attack before walking back to Selma, in an effort to morally pressure President Lyndon B. Johnson to extend federal protection to the peaceful protest.

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BLACK LIVES MATTER activists march across the George Washington Bridge in New York City on September 12, 2020, to protest systemic injustices, including the killings of Black people by police.

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Flip Schulke/Getty Images (*preceding pages*); Jason D. Little (*this page*)

ONE EVENING 10 YEARS AGO 17-year-old Trayvon Martin was walking through a Florida neighborhood with candy and iced tea when a vigilante pursued him and ultimately shot him dead. The killing shocked me back to the summer of 1955, when as a six-year-old boy I heard that a teenager named Emmett Till had been lynched at Money, Miss., less than 30 miles from where I lived with my grandparents. I remember the nightmares, the trying to imagine how it might feel to be battered beyond recognition and dropped into a river.

The similarities in the two assaults, almost six decades apart, were uncanny. Both youths were Black, both were visiting the communities where they were slain, and in both cases their killers were acquitted of murder. And in both cases, the anguish and outrage that Black people experienced on learning of the exonerations sparked immense and significant social movements. In December 1955, days after a meeting in her hometown of Montgomery, Ala., about the failed effort to get justice for Till, Rosa Parks refused to submit to racially segregated seating rules on a bus—igniting the Civil Rights Movement (CRM). And in July 2013, on learning about the acquittal of Martin's killer, Alicia Garza, Patrisse Cullors and Ayọ Tometi invented the hashtag #BlackLivesMatter, a rallying cry for numerous local struggles for racial justice that sprang up across the U.S.

The Black Lives Matter (BLM) movement is still unfolding, and it is not yet clear what social and political transformations it will engender. But within a decade after Till's murder, the social movement it detonated overthrew the brutal "Jim Crow" order in the Southern states of the U.S. Despite such spectacular achieve-

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ments, contemporary scholars such as those of the Chicago School of Sociology continued to view social movements through the lens of "collective behavior theory." Originally formulated in the late 19th century by sociologist Gabriel Tarde and psychologist Gustave Le Bon, the theory disdained social movements as crowd phenomena: ominous entities featuring rudderless mobs driven hither and thither by primitive and irrational urges.

As a member of what sociologist and activist Joyce Ladner calls the Emmett Till generation, I identify viscerally with struggles for justice and have devoted my life to studying their origins, nature, patterns and outcomes. Around the world, such movements have played pivotal roles in overthrowing slavery, colonialism, and other forms of oppression and injustice. And although the core methods by which they overcome seemingly impossible odds are now more or less understood, these struggles necessarily (and excitingly) continue to evolve faster than social scientists can comprehend them. A post-CRM generation of scholars was nonetheless able to shift the study of movements from a psychosocial approach that asked "What is wrong with the participants? Why are they acting irrationally?" to a methodological one that sought answers to questions such as "How do you launch a movement? How do you sustain it despite repression? What strategies are most likely to succeed, and why?"

JIM CROW

SOCIAL MOVEMENTS have likely existed for as long as oppressive human societies have, but only in the past few centuries has their praxis—meaning, the melding of theory and practice that they involve—developed into a craft, to be learned and honed. The praxis has always been and is still being developed by the marginalized and has of necessity to be nimbler than the scholarship, which all too often serves the powerful. Key tactics have been applied, refined and shared across continents, including the boycott, which comes from the Irish struggle against British colonialism; the hunger strike, which has deep historical roots in India and Ireland and was widely used by women suffragettes in the U.K.; and nonviolent direct action, devised by Mahatma Gandhi in South Africa and India. They led to the overthrow of many unjust systems, including the global colonial order, even as collective behavior theorists continued to see social movements as irrational, spontaneous and undemocratic.

The CRM challenged these orthodoxies. To understand how extraordinary its achievements were, it is necessary to step into the past and understand how overwhelming the Jim Crow system of racial domination seemed even as late as the 1950s, when I was born. Encompassing the economic, political, legal and social spheres, it loomed over Black communities in the Southern U.S. as an unshakable edifice of white supremacy.

Jim Crow laws, named after an offensive minstrel caricature, were a collection of 19th-century state and local statutes that legalized racial segregation and relegated Black people to the bottom of the economic order. They had inherited almost nothing from the slavery era, and although they were now paid for their work, their job opportunities were largely confined to menial and manual labor. In consequence, nonwhite families earned 54 percent of the median income of white families in 1950. Black people had the formal right to vote, but the vast majority, especially in the South, were prevented from voting through various legal maneuvers and threats of violent retaliation. Black people's lack of political power allowed their constitutional rights to be ignored—a violation codified in the 1857 "Dred Scott" decision of the Supreme Court asserting that Black people had "no rights which the white man was bound to respect."

Racial segregation, which set Black people apart from the rest of humanity and labeled them as inferiors, was the linchpin of this society. Humiliation was built into our daily lives. As a child, I drank from "colored" water fountains, went around to the back of the store to buy ice cream, attended schools segregated by skin color and was handed textbooks ragged from prior use by white students. A week after classes started in the fall, almost all my classmates would vanish to pick cotton in the fields so that their families could survive. My grandparents were relatively poor, too, but after a lifetime of sharecropping they purchased a plot of land that we farmed; as a proud, independent couple, they were determined that my siblings and I study. Even they could not protect us from the fear, however: I overheard whispered conversations about Black bodies hanging from trees. Between the early 1880s and 1968 more than 3,000 Black people were lynched—hung from branches of trees; tarred, feathered and beaten by mobs; or doused with gasoline before being set ablaze. This routine terror reinforced white domination.

But by 1962, when I moved to Chicago to live with my mother, protests against Jim Crow were raging on the streets, and they thrilled me. The drama being beamed into American living rooms—I remember being glued to the television when Martin Luther King, Jr., delivered his "I Have a Dream" speech in 1963—earned the movement tens of thousands of recruits, including me. And although my attending college was something of an accident, my choice of subject in graduate school, sociology, was not. Naively believing that there were fundamental laws of social movements, I intended to master them and apply them to Black liberation movements as a participant and, I fantasized, as a leader.

As I studied collective behavior theory, however, I became outraged by its denigration of participants in social movements as fickle and unstable, bereft of legitimate grievances and under the spell of agitators. Nor did the syllabus include the pioneering works of W.E.B. Du Bois, a brilliant scholar who introduced empirical methods into sociology, produced landmark studies of inequality and Black emancipation, and co-founded the National Association for the Advancement of Colored People (NAACP) in 1909. I was not alone in my indignation; many other social science students of my generation, who had participated in the movements of the era, did not see their experiences reflected in the scholarship. Rejecting past orthodoxies, we began to formulate an understanding of social movements based on our lived experiences, as well as on immersive studies in the field.

BUS BOYCOTT

IN CONDUCTING my doctoral research, I followed Du Bois's lead in trying to understand the lived experiences of the oppressed. I interviewed more than 50 architects of the CRM, including many of my childhood heroes. I found that the movement arose organically from within the Black community, which also organized, designed, funded and implemented it. It continued a centuries-long tradition of resistance to oppression that had begun on slave ships and contributed to the abolition of slavery. And it worked in tandem with more conventional approaches, such as appeals to the conscience of white elites or to the Constitution,

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VOTING RIGHTS activists march 54 miles from Selma to Montgomery in 1965. The third attempt to reach Montgomery succeeded on March 25 with the protection of the federal government. The heroism and discipline of the protesters, who endured violent attacks without retaliation or retreat, enabled the passage of the Voting Rights Act that August.

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which guaranteed equality under the law. The NAACP mounted persistent legal challenges to Jim Crow, resulting in the 1954 Supreme Court decision to desegregate schools. But little changed on the ground.

How could Black people, with their meager economic and material resources, hope to confront such an intransigent system? A long line of Black thinkers, including Frederick Douglass, Ida B. Wells and Du Bois, believed that the answer could be found in social protest. Boycotts, civil disobedience (refusal to obey unjust laws) and other direct actions, if conducted in a disciplined and nonviolent manner and on a massive scale, could effectively disrupt the society and economy, earning leverage that could be used to bargain for change. "Nonviolent direct action seeks to create such a crisis and foster such a tension that a community which has constantly refused to negotiate is forced to confront the issue. It seeks so to dramatize the issue that it can no longer be ignored," King would explain in an open letter from the Birmingham, Ala., jail.

The reliance on nonviolence was both spiritual and strategic. It resonated with the traditions of Black churches, where the CRM was largely organized. And the spectacle of nonviolent suffering in a just cause had the potential to discomfit witnesses and render violent and intimidating reprisals less effective. In combination with disruptive protest, the sympathy and support of allies from outside the movement could cause the edifice of power to crumble.

The Montgomery bus boycott in 1955, which inaugurated the CRM, applied these tactics with flair and originality. It was far from spontaneous and unstructured. Parks and other Black commuters had been challenging bus segregation for years. After she was arrested for refusing to give up her seat, members of the Women's Political Council, including Jo Ann Robinson, worked all night to print thousands of leaflets explaining what had happened and calling for a mass boycott of buses. They distributed the leaflets door to door, and to further spread the word, they approached local Black churches. A young minister named King, new to Montgomery, had impressed the congregation with his eloquence; labor leader E. D. Nixon and others asked him to speak for the movement. The CRM, which had begun decades earlier, flared into a full-blown struggle.

The Montgomery Improvement Association, formed by Ralph

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Abernathy, Nixon, Robinson, King, and others, organized the movement through a multitude of churches and associations. Workshops trained volunteers to endure insults and assaults; strategy sessions planned future rallies and programs; community leaders organized car rides to make sure some 50,000 people could get to work; and the transportation committee raised money to repair cars and buy gas. The leaders of the movement also collected funds to post bail for those arrested and assist participants who were being fired from their jobs. Music, prayers and testimonies of the personal injustices that people had experienced provided moral support and engendered solidarity, enabling the movement to withstand repression and maintain discipline.

Despite reprisals such as the bombing of King's home, almost the entire Black community of Montgomery boycotted buses for more than a year, devastating the profits of the transport company. In 1956 the Supreme Court ruled that state bus segregation laws were unconstitutional. Although the conventional approach—a legal challenge by the NAACP—officially ended the boycott, the massive economic and social disruption it caused was decisive. Media coverage—in particular of the charismatic King—had revealed to the nation the cruelty of Jim Crow. The day after the ruling went into effect, large numbers of Black people boarded buses in Montgomery to enforce it.

This pioneering movement inspired many others across the South. In Little Rock, Ark., nine schoolchildren, acting with the support and guidance of journalist Daisy Bates, faced down threatening mobs to integrate a high school in 1957. A few years later Black college students, among them Diane Nash and the late John Lewis of Nashville, Tenn., began a series of sit-ins at "whites only" lunch counters. Recognizing the key role that students, with their idealism and their discretionary time, could play in the movement, visionary organizer Ella Baker encouraged them to form their own committee, the Student Nonviolent Coordinating Committee, which started to plan and execute actions independently. Escalating the challenge to Jim Crow, Black and white activists began boarding buses in the North, riding them to the South to defy bus segregation. When white mobs attacked the buses in Birmingham and the local CRM leadership, fearing casualties, sought to call off the "Freedom Rides," Nash ensured that they continued. "We cannot let violence overcome nonviolence," she declared.

The sophisticated new tactics had caught segregationists by surprise. For example, when the police jailed King in Albany, Ga., in 1961 in the hope of defeating the movement, it escalated instead: outraged by his arrest, more people joined in. To this day, no one knows who posted bail for King; many of us believe that the authorities let him go rather than deal with more protesters. The movement continually refined its tactics. In 1963 hundreds of people were being arrested in Birmingham, so CRM leaders decided to fill the jails, leaving the authorities with no means to arrest more people. In 1965 hundreds of volunteers, among them John Lewis, marched from Selma to Montgomery in Alabama to protest the suppression of Black voters and were brutally attacked by the police.

The turmoil in the U.S. was being broadcast around the world at the height of the cold war, making a mockery of the nation's claim to representing the pinnacle of democracy. When President Lyndon B. Johnson formally ended the Jim Crow era by signing the Civil Rights Act in 1964 and the Voting Rights Act in 1965, he did so because massive protests raging in the streets had forced it. The creation of crisis-packed disruption by means of deep organization, mass mobilization, a rich church culture, and thousands of rational and emotionally energized protesters delivered the death blow to one of the world's brutal regimes of oppression.

FRAMEWORKS

AS I CONDUCTED my doctoral research, the first theories specific to modern social movements were beginning to emerge. In 1977 John McCarthy and Mayer Zald developed the highly influential resource mobilization theory. It argued that the mobilization of money, organization and leadership were more important than the existence of grievances in launching and sustaining movements—and marginalized peoples depended on the largesse of more affluent groups to provide these resources. In this view, the CRM was led by movement "entrepreneurs" and funded by Northern white liberals and sympathizers.

At roughly the same time, the late William Gamson, Charles Tilly and my graduate school classmate Doug McAdam developed political process theory. It argues that social movements

BLACK STUDENTS from Saint Augustine College sit at a lunch counter reserved for white customers in Raleigh, N.C., to challenge racial segregation in February 1960. Many participants in these protests were assaulted or arrested.

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ROSA PARKS refused to relinquish her seat to a white man on a bus in Montgomery, Ala., in December 1955, triggering the Civil Rights Movement of the 1950s and 1960s.

Bettmann/Getty Images (*opposite page*); Underwood Archives/Getty Images (*this page*)

are struggles for power—the power to change oppressive social conditions. Because marginalized groups cannot effectively access normal political processes such as elections, lobbying or courts, they must employ "unruly" tactics to realize their interests. As such, movements are insurgencies that engage in conflict with the authorities to pursue social change; effective organization and innovative strategy to outmaneuver repression are key to success. The theory also argues that external windows of opportunity, such as the 1954 Supreme Court decision to desegregate schools, must open for movements to succeed because they are too weak on their own.

Thus, both theories see external factors, such as well-heeled sympathizers and political opportunities, as crucial to the success of movements. My immersive interviews with CRM leaders brought me to a different view, which I conceptualized as the indigenous perspective theory. It argues that the agency of movements emanates from within oppressed communities—from their institutions, culture and creativity. Outside factors such as court rulings are important, but they are usually set in motion and implemented by the community's actions. Movements are generated by grassroots organizers and leaders—the CRM had thousands of them in multiple centers dispersed across the South—and are products of meticulous planning and strategizing. Those who participate in them are not isolated individuals; they are embedded in social networks such as church, student or friendship circles.

Resources matter, but they come largely from within the community, at least in the early stages of a movement. Money sustains activities and protesters through prolonged repression. Secure spaces are needed where they can meet and strategize; also essential are cultural resources that can inspire heroic self-sacrifice. When facing police armed with batons and attack dogs, for example, the protesters would utter prayers or sing songs that had emerged from the struggle against slavery, bolstering courage and maintaining discipline.

The indigenous perspective theory also frames social movements as struggles for power, which movements gain by preventing power holders from conducting economic, political and social business as usual. Tactics of disruption may range from nonviolent measures such as strikes, boycotts, sit-ins, marches and courting mass arrest to more destructive ones, including looting, urban rebellions and violence. Whichever tactics are employed, the ultimate goal is to disrupt the society sufficiently

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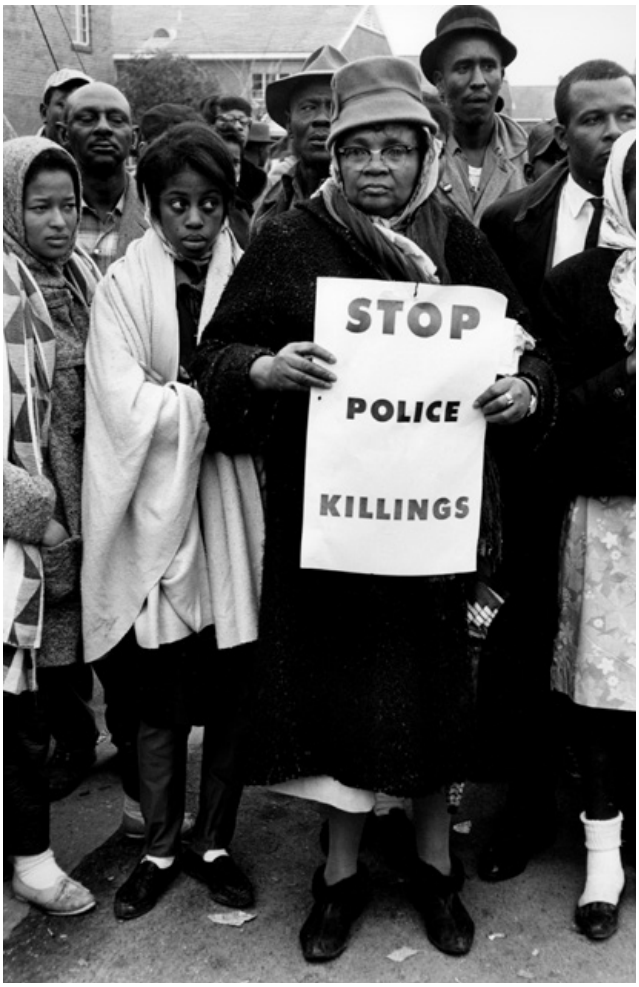
POSTER at a Selma-to-Montgomery march in 1965 protested the killings of Black people by police.



MORE THAN 200,000 people participated in the March on Washington on August 28, 1963, where King articulated the aspirations of millions with his famous "I Have a Dream" speech.

WE DEMAND DECENT HOUSING NOW!
WE DEMAND EQUAL RIGHTS NOW!
WE DEMAND DECENT HOUSING NOW!
WE DEMAND AN END TO BIAS NOW!
WE DEMAND DECENT HOUSING NOW!
THE BAPTIST MINISTERS CONFERANCE
I.U.E.
WE MARCH TOGE

Steve Schapiro/Getty Images *(top)*; Hulton Archive/Getty Images *(bottom)*

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BAYONETS wielded by police officers halt unarmed protesters seeking to reach city hall in Prichard, Ala., in June 1968, months after King's assassination in Memphis, Tenn., in April.

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GEORGE FLOYD'S murder by a police officer in Minneapolis, Minn., on May 25, 2020, triggered the largest protests in U.S. history, including this one in New York City the following June.

Justin Aharon

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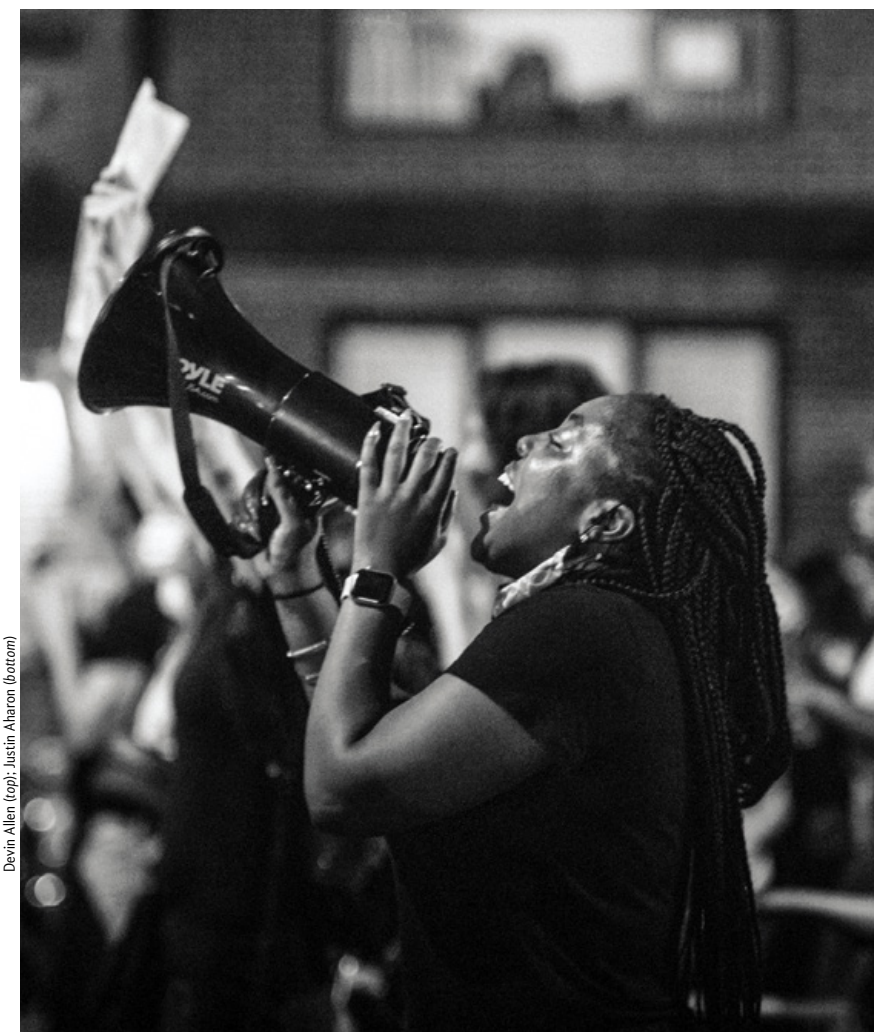
GRIEVOUS INJURIES sustained by 25-year-old Freddie Gray of Baltimore, Md., during his arrest on April 12, 2015, sparked this standoff in front of a police station. Gray died the day after the protest.



CHANTING "Wake up, wake up! This is your fight, too!" a demonstrator summons bystanders to a Black Lives Matter protest in Brooklyn, N.Y., on June 12, 2020.

Devin Allen (*top*); Justin Aharon (*bottom*)

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"GET YOUR KNEE OFF OUR NECKS" was the slogan for a protest at the National Mall on August 28, 2020, the 57th anniversary of the historic March on Washington led by King. The event honored the Civil Rights Movement while acknowledging the challenge of eradicating systemic racial and economic injustice in the U.S.

Joshua Rashaad McFadden

that power holders capitulate to the movement's demands in exchange for restoration of social order.

Decades later cultural sociologists, including Jeff Goodwin, James Jasper and Francesca Polletta, challenged the earlier theories of resource mobilization and political process for ignoring culture and emotions. They pointed out that for movements to develop, a people must first see themselves as being oppressed. This awareness is far from automatic: many of those subjected to perpetual subordination come to believe their situation is natural and inevitable. This mindset precludes protest. "Too many people find themselves living amid a great period of social change, and yet they fail to develop the new attitudes, the new mental responses, that the new situation demands," King remarked. "They end up sleeping through a revolution." But such outlooks can be changed by organizers who make the people aware of their oppression (by informing them of their legal rights, for example, or reminding them of a time when their ancestors were free) and help them develop cultures of resistance.

Collective behavior theorists were right that emotions matter—but they had the wrong end of the stick. Injustice generates anger and righteous indignation, which organizers can summon in strategizing to address the pains of oppression. Love and empathy can be evoked to build solidarity and trust among protesters. Far from being irrational distractions, emotions, along with transformed mental attitudes, are critical to achieving social change.

BLACK LIVES

ON APRIL 4, 1968, I was having "lunch" at 7 P.M. at a Chicago tavern with my colleagues—we worked the night shift at a factory that manufactured farming equipment—when the coverage was interrupted to announce that King had been assassinated. At the time, I was attracted by the Black Panthers and often discussed with friends whether King's nonviolent methods were

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still relevant. But we revered him nonetheless, and the murder shocked us. When we returned to the factory, our white foremen sensed our anger and said we could go home. Riots and looting were already spreading across the U.S.

The assassination dealt a powerful blow to the CRM. It revived a long-standing debate within the Black community about the efficacy of nonviolence. If the apostle of peace could so easily be felled, how could nonviolence work? But it was just as easy to murder the advocates of self-defense and revolution. A year later the police entered a Chicago apartment at 4:30 A.M. and assassinated two leaders of the Black Panther party.

A more pertinent lesson was that overreliance on one or more charismatic leaders made a movement vulnerable to decapitation. Similar assaults on leaders of social movements and centralized command structures around the world have convinced the organizers of more recent movements, such as the Occupy movement against economic inequality and BLM, to eschew centralized governance structures for loose, decentralized ones.

The triggers for both the CRM and BLM were the murders of Black people, but the rage that burst forth in sustained protest stemmed from far deeper, systemic injuries. For the CRM, the wound was racial oppression based on Jim Crow; for BLM, it is the devaluation of Black lives in all domains of American life. As scholar Keeanga-Yamahtta Taylor and others point out, when BLM was emerging, over a million Black people were behind bars, being incarcerated at more than five times the rate of white people. Black people have died at nearly three times the rate of white people during the COVID-19 pandemic, laying bare glaring disparities in health and other circumstances. And decades of austerity politics have exacerbated the already enormous wealth gap: the current net worth of a typical white family is nearly 10 times that of a Black family. For such reasons, BLM demands go far beyond the proximate one that the murders stop.

The first uprisings to invoke the BLM slogan arose in the summer of 2014, following the suffocation death of Eric Garner in July—held in a police chokehold in New York City as he gasped, "I can't breathe"—and the shooting of Michael Brown in Ferguson, Mo., in August. Tens of thousands of people protested on the streets for weeks, meeting with a militarized response that included tanks, rubber bullets and tear gas. But the killings of Black adults and children continued unabated—and with each atrocity the movement swelled. The last straw was the murder of George Floyd in May 2020 in Minneapolis, Minn., which provoked mass demonstrations in every U.S. state and in scores of countries. Millions of Americans had lost their jobs during the pandemic; they had not only the rage but also the time to express it.

By fomenting disruptions across the globe, BLM has turned racial injustice into an issue that can no longer be ignored. Modern technology facilitated its reach and speed. Gone are the days of mimeographs, which Robinson and her colleagues used to spread news of Parks's arrest. Bystanders now document assaults on cell phones and share news and outrage worldwide almost instantaneously. Social media helps movements to mobilize people and produce international surges of protests at lightning speed.

The participants in BLM are also wonderfully diverse. Most of the local CRM centers were headed by Black men. But Bayard Rustin, the movement's most brilliant tactician, was kept in the background for fear that his homosexuality would be used to discredit its efforts. In contrast, Garza, Cullors and Tometi are all Black women, and two are queer. "Our network centers those who have been marginalized within Black liberation movements," the mission statement of their organization, the Black Lives Matter Global Network, announces. Many white people and members of other minority groups have joined the movement, augmenting its strength.

Another key difference is centralization. Whereas the CRM was deeply embedded in Black communities and equipped with strong leaders, BLM is a loose collection of far-flung organizations. The most influential of these is the BLM network itself, with more than 40 chapters spread across the globe, each of which organizes its own actions. The movement is thus decentralized, democratic and apparently leaderless. It is a virtual "collective of liberators" who build local movements while simultaneously being part of a worldwide force that seeks to overthrow race-based police brutality and hierarchies of racial inequality and to achieve the total liberation of Black people.

WHAT THE FUTURE HOLDS

BECAUSE SOCIETIES ARE DYNAMIC, no theory developed to explain a movement in a certain era can fully describe another one. The frameworks developed in the late 20th century remain relevant for the 21st, however. Modern movements are also struggles for power. They, too, must tackle the challenges of mobilizing resources, organizing mass participation, raising consciousness, dealing with repression and perfecting strategies of social disruption.

BLM faces many questions and obstacles. The CRM depended on tight-knit local communities with strong leaders, meeting in churches and other safe spaces to organize and strategize and to build solidarity and discipline. Can a decentralized movement produce the necessary solidarity as protesters face brutal repression? Will their porous Internet-based organizational structures provide secure spaces where tactics and strategies can be debated and selected? Can they maintain discipline? If protesters are not executing a planned tactic in a coordinated and disciplined manner, can they succeed? How can a movement correct a course of action that proves faulty?

Meanwhile the forces of repression are advancing. Technology benefits not only the campaigners but also their adversaries. Means of surveillance are now far more sophisticated than the wiretaps the FBI used to spy on King. Agents provocateur can turn peaceful protests into violent ones, providing the authorities with an excuse for even greater repression. How can a decentralized movement that welcomes strangers guard against such subversions?

Wherever injustice exists, struggles will arise to abolish it. Communities will continue to organize these weapons of the oppressed and will become more effective freedom fighters through trial and error. Scholars face the challenge of keeping pace with these movements as they develop. But they must do more: they need to run faster, to illuminate the paths that movements should traverse in their journeys to liberate humanity. SA

Aldon Morris is Leon Forrest Professor of Sociology and African American Studies at Northwestern University and a previous president of the American Sociological Association. His landmark books include *The Origins of the Civil Rights Movement* (1986) and *The Scholar Denied: W.E.B. Du Bois and the Birth of Modern Sociology* (2015).

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Intensified Inequity

The poor, no matter where they live, will suffer the greatest lasting toll from the pandemic

By Joseph E. Stiglitz

THE NOVEL CORONAVIRUS EXPOSED and exacerbated the fragility and inequity of the global economic system. Many countries, including the U.S., proved unable to manufacture simple products such as face masks, let alone more complicated ones such as ventilators. Multiple supply chains broke. The resulting ordeal will almost surely lead to the creation of more onshore production facilities. An ugly nationalism displayed by countries that have hoarded vaccines and put profits over lives shows no sign of abating, despite its potentially devastating outcomes for the world.

The pandemic's most significant outcome will be a worsening of inequality, both within the U.S. and between developed and developing countries. Global billionaire wealth grew by $4.4 trillion between 2020 and 2021, and at the same time more than 100 million people fell below the poverty line. Just how bad the situation will become depends on how long the disease rages and what policy makers do to control it and its consequences.

In part because of its huge income and wealth inequalities, the U.S. suffered the most COVID-attributed deaths of any country. SARS-CoV-2 went after those with poverty-related health conditions and with jobs that cannot be done in isolation. Surviving from paycheck to paycheck and not having even the most basic rights of health care and paid sick leave, many Americans lacked testing to know if they were infected and either went to work, spreading the virus, or sought help too late.

The poorest will also suffer the most from the pandemic's economic aftermath—in particular, from the loss of jobs, disproportionately

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concentrated in low-wage service sectors. Just as worrisome, poorer children have experienced terrible educational setbacks as schools moved online, presaging a potentially long-term aggravation of inequality and deprivation.

Still, a strong policy response in the U.S. has created a shallower economic downturn than elsewhere. President Joe Biden's American Rescue Plan *reduced* childhood poverty in 2021 by more than a third, demonstrating that the country's high level of poverty has always been a matter of choice. But the measures taken so far are temporary palliatives. The Build Back Better plan was designed to make these achievements more permanent and to reduce inequality in all its dimensions. If it fails to pass, we can expect an enduring increase in poverty. Matters will almost surely get even worse if the pandemic continues.

It was a triumph of scientific, political and economic organization that we were able to so quickly develop, produce and distribute billions of vaccine doses. But matching these enormous successes are colossal failures. Despite having the technology and the resources, we have failed to ramp up vaccine supply and distribute enough doses in poor countries.

Markets can solve most economic problems—a shortage of glass vials, for example. They cannot, however, overcome the legal barriers presented by intellectual-property rights that have given the current producers of vaccines monopoly power. Those pharmaceutical companies have an incentive to restrict manufacturing, allowing them to charge prices that are a multiple of the cost of production—although most of the original R&D, and even much of the initial productive capacity, was publicly financed.

The failure to bring the disease under control and the unequal burden of the disease are thus largely a failure of our economic and political systems. Had a vaccine intellectual-property waiver, which would allow any firm in the world to produce the vaccines after paying a fair royalty, been adopted when it was first proposed in 2020, we would almost surely have far greater supplies today. Hope may have arrived in the form of CORBEVAX, a vaccine that has no patent restrictions and is easy to make, circumventing national selfishness and corporate greed. If it proves sufficiently safe and effective, it could get the world inoculated, reducing the likelihood of a more deadly, more contagious or vaccine-resistant mutation.

The global inequities in vaccine distribution are matched by glaring inequities in responses to the economic downturn. Whereas the U.S. spent a quarter of its gross domestic product (GDP) to keep the economy going, poor countries could spend but a mere fraction of that amount. Some countries have seen a drop in GDP of 10 percent or more, with especially adverse effects on the poorest. And although the U.S. can manage the large increase in debt, poor nations will find it difficult to do so.

Unfortunately, then, the economic shock of the pandemic most likely will linger. It will be those at the bottom—poorer Americans and most people in poorer countries—who will still suffer the consequences years from now. Not doing everything we can to control the disease and its economic aftermath *everywhere* is shortsighted. Dithering and dawdling will allow COVID to rage on, with further supply chain disruptions contributing to shortages, postponing a robust global recovery and entrenching unconscionable levels of inequality. SA

Joseph E. Stiglitz is a University Professor at Columbia University and chief economist at the Roosevelt Institute. He received the Nobel Prize in economics in 2001. Stiglitz chaired President Bill Clinton's Council of Economic Advisers from 1995 to 1997 and served as the chief economist and senior vice president of the World Bank from 1997 to 2000. He chaired the Sarkozy Commission (2008–2009) and an expert group (2013–2019) at the OECD for devising measures for well-being and sustainability.

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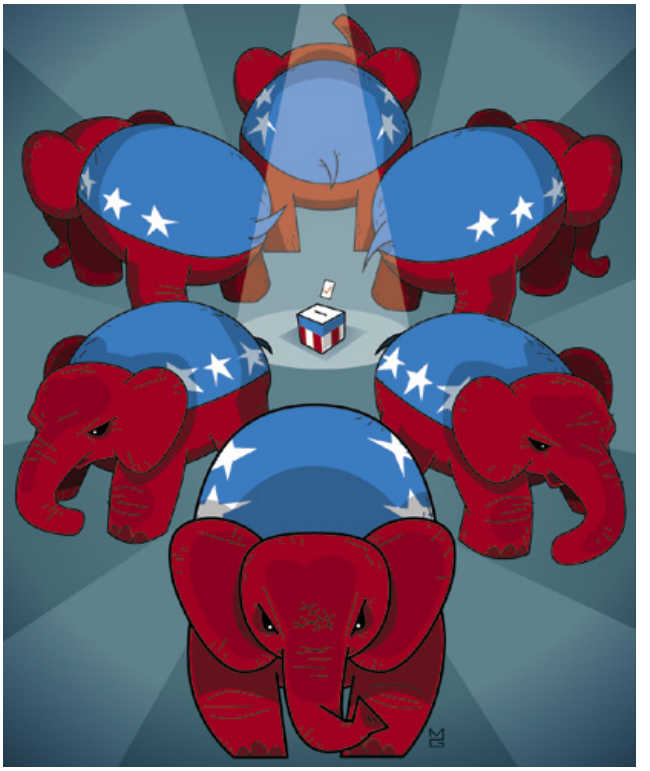
END NOTE

Protect Voting Rights

They boost suffrage, not fraud

By the Editors



In 2021 Republican legislatures in 19 states passed 34 laws that restricted access to voting in more than a dozen different ways. And those are just the bills that succeeded; hundreds of other provisions, some still under consideration, were introduced nationwide. "The momentum around this legislation continues," the Brennan Center for Justice, which tracks these efforts, wrote on its Web site. At least 165 restrictive voting bills were already on the docket for this year by mid-January. "These early indicators—coupled with the ongoing mobilization around the Big Lie (the same false rhetoric about voter fraud that drove [last] year's unprecedented wave of vote suppression bills)—suggest that efforts to restrict and undermine the vote will continue to be a serious threat in 2022."

The GOP has justified voting restrictions by saying that it is safeguarding elections against fraud and that certain protections against electoral bias are no longer necessary. Evidence belies this ploy to seize power by disenfranchising voters, especially minorities, who tend to vote Democratic. Voter fraud is exceedingly rare in the U.S. and hasn't increased since the 1965 Voting Rights Act. But minority suffrage has grown tremendously, and the benefits of federal oversight have persisted. Alarmed by this trend, conservative legislators and jurists began chipping away at codified voting rights decades ago. They stand to gain even more ground during this year's midterm elections if left unchecked.

While odious lies about a stolen election propelled the current wave of restrictions, the path that led to this point was laid back in 2013. In the case of *Shelby County v. Holder,* the Supreme Court dismantled a key pillar of the Voting Rights Act called "preclearance," which required jurisdictions with a history of discrimination to get Justice Department or federal court approval for any planned changes to electoral rules. Arguing that patterns of discrimination had changed, Chief Justice John Roberts wrote in the majority opinion that Congress should not use "a formula based on 40-year-old facts having no logical relation to the present day."

Desmond Ang, an expert in public policy and race at Harvard University, disagrees, saying that preclearance is as essential to civil rights today as it ever has been. According to an analysis he published in 2019, that critical provision of the Voting Rights Act alone "continued to bolster enfranchisement over four decades later," especially among minorities. So enduring were the benefits, he wrote, that "broad preventative oversight encompassing the universe of potential voting changes may be the most effective means of curbing discrimination in settings like the United States, where electoral rulemaking is highly decentralized and opaque."

In a similar vein, sociologists Nicholas Pedriana and Robin Stryker concluded in a 2017 comparative analysis that of three seminal civil rights laws passed in the 1960s—the Voting Rights Act, the Fair Housing Act and the equal employment opportunity provisions of the Civil Rights Act—the Voting Rights Act was the most successful in promoting equality. Its success depended largely on what the researchers called group-centered effects, which focus on systemic disadvantage rather than individual harm, discriminatory consequences rather than intent, and remedial group results rather than justice for individual victims or wrongdoers. Removing that statutory framework produces the opposite effect, Stryker says: highly effective, systematic suppression of minority votes.

In January the Democrats' best efforts to date to repel the current onslaught of voting restrictions—the Freedom to Vote Act and the John R. Lewis Voting Rights Advancement Act—failed in the Senate. The former would have established nationwide standards for ballot access and hindered other forms of electoral prejudice such as gerrymandering. The latter would have reversed the 2013 Supreme Court ruling on preclearance as well as another one last year, which made it harder to challenge electoral rules in court on the grounds of discrimination. The bills contained the type of broad-based, preventive strategies that have been so effective at fostering racial equality at the very core of our democratic system. Ang and Stryker lamented their demise and conceded that it's difficult not to despair in the face of intense political polarization.

For decades the Voting Rights Act enjoyed bipartisan support. No longer. Yet we must restore and expand federal oversight and jurisdiction of biased electoral rules. Until then, it is incumbent on social justice movements and everyone who cares about the most fundamental of democratic rights to keep the pressure on. As sociologist Aldon Morris wrote for us (*page 112*), "when President Lyndon B. Johnson formally ended the Jim Crow era by signing the Civil Rights Act in 1964 and the Voting Rights Act in 1965, he did so because massive protests raging in the streets had forced it." SA

Illustration by Martin Gee

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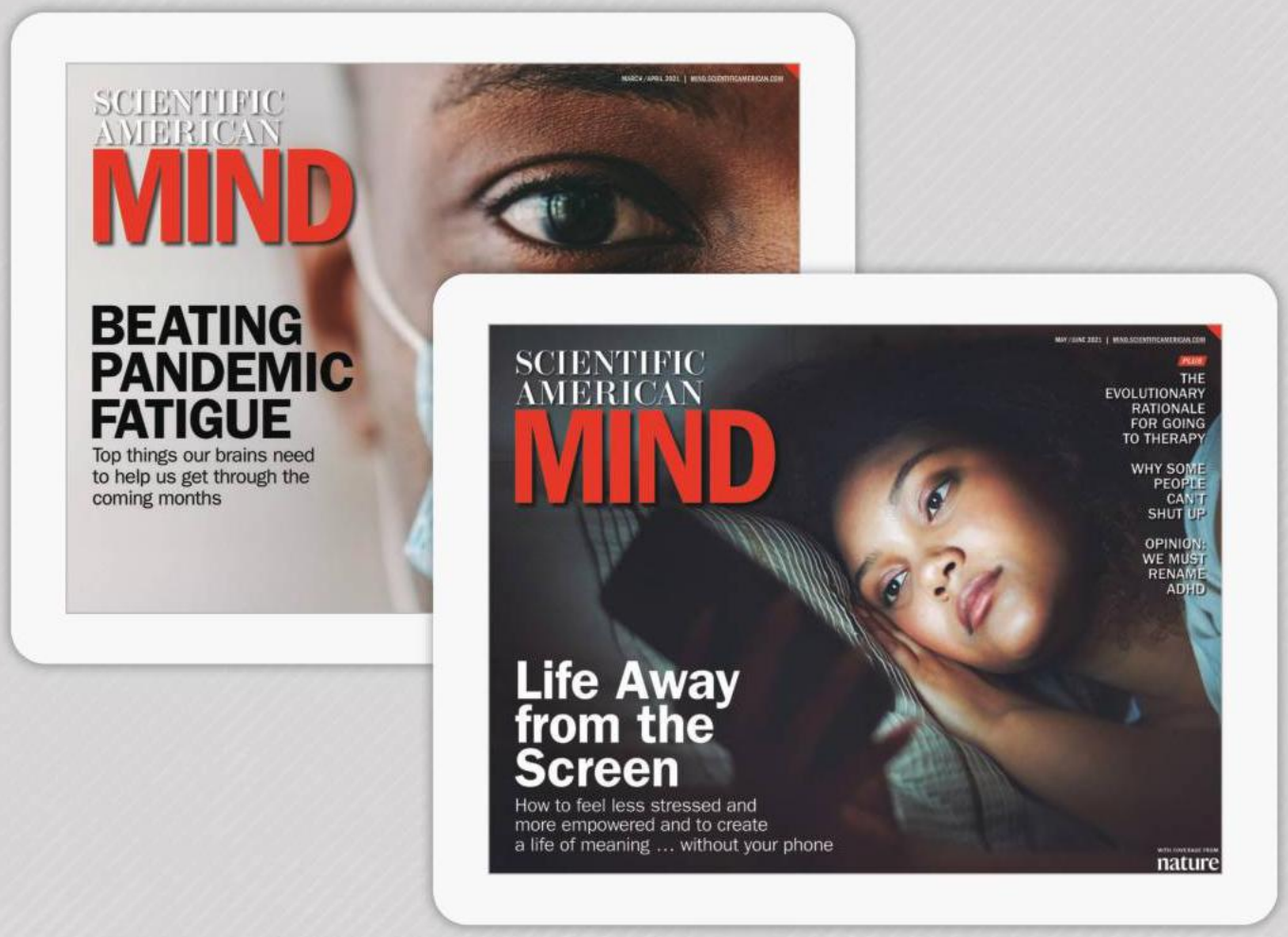
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